The Philosophical Implications of Evolutionary Biology

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Benjamin J. Hanik

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Abstract

'The Philosophical Implications of Evolutionary Biology' is a philosophical enquiry written in dialogue form which asks the question 'how does modern evolutionary theory affect our notions of self and freewill?' The enquiry begins by examining the process of decision making, followed by an evolutionary explanation of how and why we make decisions. With this knowledge a theoretical value system is created which cumulatively describes the source of the perception of quality and the orientation of all human thought and behaviour. In conclusion a logical deadlock is reached: it becomes evident that our values are dictated by our evolutionary past, that we are trapped within this value system, and that even if we attempt to break free from it we inevitably fail because everything we do, even if it is designed to go directly against the system, is still inescapably directed by it.

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It is early winter; a layer of clean white snow blankets the landscape. Two thickly clad figures, one youthful, the other aged and leaning on a cane, walk slowly along a winding path, their warm breath twirling in the crisp morning air. The older of the two begins to speak:

- I think it would be worthwhile for us to see this dialogue we are about to embark on as the creation of a theoretical tool. We give shape to this tool by discussing and examining specific ideas and concepts, and we use it by allowing these to coagulate into a mass of points which together force us to see ourselves and our surroundings in a new way. Troublesome though, is that there is no definite start or end to the things we are going to talk about: instead everything seems to crisscross back and forward and it is necessary for us to first understand certain ideas before we can understand others, but we then find that we also require the latter in order to understand the first. Because of this I think it best if we begin by having at least some sort of idea about what lies ahead, and we can get this by analysing the processes involved in making decisions.
- Let's start with that then.
- Very well. Firstly, we should be clear about what we mean when we say that we make decisions. It seems that we posses a distinct ability, which we might call conscious decision making, or freewill if you really want to, and through this ability we make choices and decisions and carry them out with actions. We believe that this ability is unique to the human species, that it does not exist in other forms of life (or at least not as it does in ourselves), and that it most definitely does not exist

in non-living things. Animals and plants do not have a choice in their actions, and are bound to follow their predetermined instincts. Inorganic things, such as computers, cars, rocks, and water all follow a predefined set path of motion without any conscious decision making being involved, regardless of how complex that motion may be. Does this sound right to you?

- I think that this is how we see things.
- So you believe, then, that we are the sole possessors of this extraordinary gift?
- Yes.
- Then you will surely disagree with what I'm about to say as it goes against this very notion, against the notion that even we are able to make decisions.
- I surely would disagree. It's obvious that we are able to make decisions, and what's more we are consciously aware of making them!
- Yes, that's true, but I want to show you that what seems to be the case is not necessarily so. For now consider how the path we are walking on splits in two up ahead. Do you know where each of the two paths lead?
- I do.
- Then you now have a choice between two options, between these two paths. And you're aware where each leads, that is to say, you know the consequences of taking either one?
- Yes.
- Good. Now, lead on and I will follow you.

The figures reach the point at which the two paths diverge and, after a short pause, set out on the left path, which disappears over a small hill in the distance.

- There, I've chosen a path. Now explain how this is significant?
- Do you know where this path leads?
- Yes, it leads to my house.
- So you would say that that is the reason you chose this path?
- Well, it is where we are heading anyway.
- Is it not also possible for us to reach your house by the other path?
- It is, but that takes far longer.
- Why did you not pick the other path?
- As I just said: because it takes longer.
- Oh, yes. But why did that affect your decision?
- … I didn't consider it closely. I guess because it's cold outside and I'm in a hurry to get inside where it's warm.
- Indeed, so we can say that you took the path which resulted in you having to spend the least amount of time in the cold. But I would also add that it is normal to take the shorter of two paths, if there is no reason to take the longer.
- Such as?
- Well, I was merely thinking that perhaps if we really enjoyed walking in the cold, or if there was some beautiful scenery, then we would willingly have chosen the longer path.
- Yes, I guess that's true.

- Regardless, you had two paths available, you made a choice between them, deciding on one over the other, and we agree that this choice was made based on the characteristics that this path had and the other did not.
- It seems so.
- What I am trying to do is draw your attention towards the processes involved in our "ability" to make decisions. For instance, it is important to see that there is a distinct relationship between making a choice and the properties of whatever that choice is about. Imagine for a moment that the other path which we did not take did not lead to your house but instead led somewhere far away, for then we could without a doubt say that you chose *this* path over the other solely because it has the property of 'leading to your house', and you chose the path with this property because you desired to go there.
- That seems obvious, surely.
- Remember that for now we are merely pointing out the obvious, so have patience.
- Very well.
- Now, when we consider our choices in this fashion something becomes apparent: we make choices based on what end, that is to say, what consequence, we want to achieve or obtain, and also what seems to be, at the time, the *best* way of achieving that end. Simply put: we make choices because we want something, and the choices we make reflect the best way we know how of getting whatever it is we want.
- This sounds reasonable for some cases, but surely it isn't always true? What you are saying sounds to me like an over-generalisation: I'm sure that sometimes we make

bad choices on purpose, or that we make choices where we are aware that the consequences are not desirable.

- Well, to determine this you could try to come up with an example of where my assertion is not true, a situation where we knowingly make bad decisions. If you cannot find one then we can say that it applies to all choices and the generalisation holds, do you agree?
- I'm sure I can find an example.
- Before you begin looking for one perhaps you ought first to consider the example we have just experienced, so as to see what is involved, and what we are looking for.
- What do you mean?
- In this example you wanted to return to the comfort and warmth of your home because it is cold outside. You had two paths in front of you, two choices, and you were required to choose between them. You chose the path which brought about what you desired in the best way possible, which here meant the path that would bring you home quicker than any alternative. Do you agree?
- Yes.
- Furthermore, if the other path had not led to your house but away from it, then we could say that there was no contest between the two choices you could have made. If you desire to go home then you wouldn't very well choose the path which leads in the opposite direction!
- I agree.
- But notice that the choice *was* available to you. It was there for you to make, it was just that your desire was such that it voided, so to say, that choice because it would

have resulted in not only a failure to satisfy your desire but also making the situation worse for any future attempt to do so. Now consider the actual choice you made: wasn't the second path, the one you did not pick, simply of lesser value to your aim? Let me explain what I mean here. We can consider the consequences of what we make choices about by arranging them in terms of their value (in this example the value is dependent on the amount of time you needed to spend in the cold):

The choices you could have made were:

1. The path that leads quickly to your house – Best possible value.
2. The path that takes longer – Lower value (more time in the cold).
3. The theoretical path which does not lead to your house – Worst possible value.

- The 'quality' of any choice is determined by the extent to which its consequences satisfy the desire which caused it. Something can only be good or bad, *have quality*, insofar as it succeeds in fulfilling an intended aim or purpose, or denies another. That is: something is good if it brings about what we desire, and is bad if it hinders us in getting what we desire.
- Yes, all right, in this example it does seem like I chose one thing over another because it satisfied my desire in the best possible way. But I'm sure this does not apply to each and every decision I make.

- Well, if you do somehow find an example counter to what I have described then it must be as it is because of one of two reasons: firstly it could be that the person who made the choice was simply not aware that another possible option would have been better, or was simply not aware that any another option existed. That is: if you had not known which of the two paths was shorter, and you had chosen the longer one, then you would have made a bad choice, but unbeknownst to you. And furthermore you would *still* have searched for any possible sign as to which of the two paths was shorter, perhaps even taking into consideration a hunch or a gut feeling. Secondly, someone may deliberately choose the longer path…
- Ah, and this is just the type of example I was going to give to you! If I deliberately had taken the longer path even though I desired to escape from the cold, then that would be an example of going against the best way to satisfy my desire.
- And this is precisely what I wanted to talk about next. Do you recall that I briefly mentioned this when I said that we might have taken the longer path if we had wanted to see the scenery, or if we generally enjoyed walking in the cold?
- Yes.
- This is getting more complicated now because we need to consider more than one desire at the same time:

    1. The desire to get home to avoid the cold (and it is implied that this is to be achieved as quickly as possible).
    2. The desire to look upon beautiful winter scenery (which was only possible by taking the longer path).

- However, to look upon the beautiful winter scenery you must brave the cold, and thus only one of these mutually exclusive desires can be fulfilled in this situation because you only have this one body, and it is only able to carry out any one action at any one time. That is: *you are only able to take one path at a time*. Now visualise these two desires contending for dominance. If one wins then you take the right path to look at the scenery, if the other wins you take the left path to get home quickly. Do you agree?
- It is a strange way of looking at it, but it does make sense.
- We are in the business of making the normal seem strange! If you do not think about it too hard then decision making, this ability to make choices, seems normal and ordinary because we can all do it, and do it so easily. It is necessary that we break free from this view if we ever wish to see things for what they are. Now pay attention because we have come to the root of the decision making process, and that is the question: why does one desire win over all others?
- I suspect it is because we choose it!
- Absolutely not! This is precisely where everyone goes astray! It is instead the desire itself, *once it has won the struggle for importance,* which causes us to choose either this or that path. This is because only when we have an aim, a goal, *a desired consequence*, to achieve, to direct our decision making towards, that we can move and act. If we did not have this then how could we possibly make decisions about anything? If you lacked any desire then how would you have been able to choose the path we are on now over the one we did not take? On what basis would you have made the choice if the desire had not gifted you with the preference for one

consequence over another? If you had lacked preference then we would still be standing back there at the junction![1]

- Very well, but what I meant was that even if desire leads to preference, we are still able to make decisions *about* desires. We do have some control over them; we are all able to resist and change desires to a certain extent, are we not?
- Perhaps first we ought to complete your sentence because there is something missing.
- What do you mean?
- It would make things much clearer if you say "We are all able to resist certain desires to some extent, *if we believe it is beneficial to do so.*"
- How does this make anything clearer?
- It will take some explaining. Firstly, yes, it does indeed seem that we have some control over our desires and that therefore we are able to make "bad" decisions wilfully. However, this is a false impression, and in order to see why consider the reasons for making such a decision, for choosing to resist a desire.
- Because I believe it will be beneficial?
- Exactly. The point is that we are able to resist certain desires because doing so enables us to satisfy other, more important desires. For example: a very devote monk may resist the desire for sexual relations because his desire for celibacy (and his belief in its consequential rewards) is more important than sexual gratification. Or you might resist the desire to get away from a painful injection because the consequences of the injection, such as curing a disease, are far more important to you.

- We can formulate this in the following way:

> If fulfilling desire 1 brings about consequences 'a' and 'b' but satisfying desire 2 requires that we do everything possible to hinder the bringing about of 'b' then the desire which is of higher importance at that point in time will win.

- We satisfy and resist desires according to their and other desires' level of importance, according to what we, at that point in time, consider to be best.[2] But this is only true for any one moment because the importance of a desire can change *dependent on the consequences the fulfilment of that desire would bring about*. The level of importance of a desire may change at any moment and for any number of reasons, such as obtaining new information, the time of day, or perceiving changes in our environment or circumstance. For example, the level of importance and thus urgency of the desire to urinate is dependent on how full your bladder is. Or if the devote monk were to suddenly, for whatever reason, believe that celibacy is a terrible sin punishable by eternal damnation, then he might very quickly change his actions. Because of this we should begin thinking of not only one desire at one time, but of a multitude of desires all competing over time for the right to direct the goals of the body, all setting up an ever varying timetable for this purpose. Thus here *importance* really implies a multitude of factors, such as power and urgency: if we say that one desire is more important than another then this simply means that the consequences of the first are more sought after (desired) than those of the second.

- From the confused look on your face I believe it is time to create an example. Let us imagine you have agreed to participate in an experiment involving cake. A large, delicious looking slice of cake is placed in front of you and, although you do not know it, you have been wired up to receive a painful electrical shock each time you take a bite from it.
- Ha-ha, what a horrible experiment!
- Ah, but it is in the extreme that we can most easily find and describe the underlying reasons for something. So, you eat piece of the cake, and receive a painful shock. After the shock you no longer want to eat the cake because you want to avoid pain, and we could now say that you have wilfully "controlled" your desire to eat the cake. However, this is just a retrospective description of what has happened; a convenient explanation for something that would have happened *anyway*. If we try to describe what happened without using the notion of choice, and instead speak of competing desires we would say:

> When you saw the cake you were overcome with the desire (1) to eat it. When you ate the cake you received pleasure from its sugary content (a) and a painful shock (b). You learnt that one consequence of eating the cake was pain (b). When you felt the pain you were overcome with a desire to avoid further pain (2). Because the desire to avoid pain (2) is more important (or powerful) than the desire to get pleasure from eating the cake (1), it provided you/your body with an aim towards the fulfilment of which subsequent decisions were made, i.e. not eating more cake.

- And what if I loved the cake to such an extent that I would gladly suffer these electrical shocks just to taste it? Or if the electrical shocks were of a mild nature? Wouldn't you then agree that I chose to eat the cake regardless?
- In that case we would just say that the desire to eat the cake (desire 1) was more powerful than the desire to avoid pain (desire 2), or *that* specific pain, and that thus it dictated your actions (i.e. caused you to eat more of the cake and tolerate the shocks). This is *exactly the same process* as for the other choice where you did not eat the cake, only this time with different placeholders, with different levels of importance. For now it does not matter to us *which* desire dictated your actions, only that *some* desire did so: this is because we are describing the framework, the general process, not what the individual cases entail.
- I see.
- The second point here is that this feeling of "having made a choice" is redundant because *some* choice and its ensuing action would have happened anyway. Here we must ask ourselves: *what does it mean to say that I have made a choice*? Does it not mean exactly what I have just described? That a desire or combination of desires has given us a preference and that we have acted out on that preference in order to achieve it in the best possible way we know how?
- It seems so.
- If this is the case then where do 'we' fit into the story? What am 'I'? What does it mean to say "*I* desire" as opposed to "the desire exists"?

The two figures reach the top of the hill, from which a small village encircled by a vast snow covered forest can be seen in the distance. After appreciating the view for a while they continue along the path leading towards the village.

- Listen: through these descriptions I am trying to show you that there is nothing to explain, that we merely need to open our eyes and see what is happening. I am trying to point out that we do not need to explain away our actions with "*I* want" or "*I* choose", that such explanations are superfluous because whatever happened would have happened anyway. I want to show you that we have no control over which desire determines our subsequent actions; that we have no such ability as "choice", and that at the end of the day we pull blinds over our eyes and say assuredly after the fact that "that is what I wanted anyway" as if we had had any say in the matter, as if we had made any choice to that end!
- Then you are saying that we do not make these choices? Because if that is so then I'm not sure if I agree with you.
- At this point I don't expect you to. It is difficult to see all this because you are inclined right from the start to seek an answer which fits your worldview, the one in which you have the ability to make choices, because that is the way it seems to you.
- So essentially, if I understand you correctly, you are claiming that even though my experiences and my observations tell me that I have freewill, that I make conscious choices freely, this is actually false and in reality I have no control over my desires, and thus over my actions?

- Quite right, but you are unintentionally constructing a misrepresentation of what I have said, and it is this which is causing confusion. Let me repeat your words, but listen to the emphasis: "…and in reality *I* have no control over *my* desires, and thus over *my* actions." It sounds as if you are saying that you are separate from your actions and your feelings, as if you were a soul imprisoned within your body, which suffers at the will of the desires and is only able to watch and feel what is happening on the outside.
- Is that not what you are suggesting?
- Absolutely not. However, I cannot tell you so simply what I *am* suggesting: instead my aim is to show you. But the problem is that you…, no, in fact we *all* see things through a specific worldview, one which is based on observations and assumptions of how things seem to be, and the things we are describing now simply do not fit into this worldview, or, that is, the worldview we hold will not accept what we have discovered because it goes against how things seem to be. But through careful description of how things are without the use of this worldview we are able to better see how things really are. Listen: seeing the world through this kind of worldview is like starting an argument based on untested and unfounded premises: everything that follows will be flawed, no matter how perfectly and beautifully it is argued. It is like believing something to be true simply because it is already in our head, or simply because it seems so, without ever asking how it got there or testing to see if it is in fact true. It is foolish to believe that the sun moves around the earth simply because we see it move in such a fashion every day, simply because it seems to be so!
- Ok, I see your point.

- Good, but there is a difference between seeing and actually doing. It takes will and concentration to see things in any other way because to use the worldview we all share is natural, is how we have always done it. To see things differently is perhaps the single most important thing you will learn here, and that is really what all this is about, all this walking and talking and discussing: I am trying to get you to see everything as it is.

Following a stone walkway between fragrant, snow-covered pine boughs the two figures reach an old house nestled amidst white hedges and gardens on which a chimney breathes out lazy wisps of smoke. They enter through an aged wooden side door, hang their coats and, after each taking a chair, sit and warm themselves by the open brick fireplace glowing quietly in the corner of the small room. The older of the two, with a stern look of concentration on his face, continues:

- Perhaps for now we ought to turn to explanation, and later return to the subject of the self.
- If you think that is right.
- The first thing we should do is find an explanation for *why* the things we described are as they are. We can start this by finding out what determines the existence and importance of desires themselves, and for this we need to journey into the field of evolutionary biology. However, this will be more a lecture than a dialogue, a presentation of points if you will. This is mainly for two reasons: firstly these points are not controversial: they are readily available in any school biology textbook and

thus do not really need to be discussed as much as merely stated, and secondly they do not form any clear comprehensive line of reasoning from start to finish, but instead form the basis for a new *way of understanding something*, a new way of looking at the world and ourselves within it.

- Then please begin.

- Before we begin I feel it is important that we differentiate between normative theories and explanatory theories. A normative theory describes how something should be, whereas an explanatory theory merely explains how something is. I will only be offering explanatory theories: descriptions and explanations of how things are, or at least how I think they are, with no opinion on how they should be. By the end of our discussion you will hopefully have understood the importance of this distinction, and why I make it.

- You should not think of evolutionary theory as just another abstract subject which has no relevance to you as a person, such as geometry or astronomy, because, unlike with these, through evolutionary theory you learn what you are and where you came from.[3] And indeed this division is a good one for us to make: first we will discuss *what we are* by looking at genetics, and then *where we come from* by looking at the process of natural selection.

- To start with, your physical body is the expression of the genes found within your cells. These genes, in terms of the information they hold, have been there from your

conception, and have built and regulated your body following a set code. Think of all the different stages your physical body went through and is going to go through, and all the changes associated with each: baby, toddler, young child, teenager, adult, middle-aged, old person, and all the unnamed stages in between. The growth spurt and unparalleled capacity for learning as a child, the gush of hormones and changes in your body as a teenager, these were all predetermined to occur at some point in time.

- It is true that to a smaller extent the environment can affect your genes and your body,[4] but it is very important to understand that this does not imply indeterminacy: *it is only because your genes created your body that your surroundings can have any affect on it.* Your skin is only able to scar and tan because there are genes which regulate its creation and dictate the processes required for healing wounds and reacting to sunlight. Without genes a knife would cut through thin air and the sun would shine on nothing.

- An important part of changing the way you see things involves understanding that the genes in your body are not *your* genes; that instead the body they built and regulate, that body you are in right now, was created by following specific instructions for a specific aim. This aim is ultimately the replication of the genetic code which built the body, and thus we say: genes build bodies so that through these bodies they are passed on into new bodies. The point is that even though it is common convention to say "my genes" it is rather that the genes would refer to our

bodies as their own vehicles or tools because they created them, and are steering them at this very moment for their own ends.[5] Although right now this might seem like a strange thing to say, later you will understand that fundamentally everything we are discussing relates back to this very point.

- It is also important to understand that genes do not dictate features directly, that there are no genes for arms or legs. To understand how genes work imagine you are following a recipe to bake bread. The recipe calls for yeast, flour, water, salt and perhaps a little butter, and if you follow the recipe carefully you will end up with a tasty loaf of bread. However, if you somehow make a mistake then a number of different things can happen depending on the severity of the mistake: by not adding flour you will end up with a watery mess, but by forgetting salt you will still have a normal looking loaf that just tastes a little different. The point is that by forgetting an ingredient you will not end up with a loaf of bread that is missing a few slices, and it is the same way with genes: there is no gene for an arm or a leg, just as there is no ingredient in the recipe for a specific slice of the bread. Instead there are genes which build muscles and others which build bones, and still others which dictate the location and shape of these, and then there are genes which build skin, and others which say where the skin goes. Missing any of these genes means the loss of whichever protein that gene coded for, and thus ultimately whatever it was that that protein was used to build or do. It does not mean the loss of an entire body part. If you alter specific things in a recipe, such as using too much flour, then this will affect the entire loaf, not just one part of it. This is also true for genes: a simple

change in the gene which controls skin pigmentation can radically alter your entire skin colour. In fact, apart from for your organs you only have genes to build one side of your body, but you also have another small set of genes somewhere else which simply say to mirror those body parts on the other side, in the end resulting in a complete body.

- A good analogy for this can be found in computer science. There are many different processes used to electronically represent pictures. One of these is called a 'raster image', which is a file made up of rows and rows of individual pixels, each with its own colour code, which combine to form a complete picture. This information is encoded in the following format: [at pixel coordinate 451,191 draw colour X] for each and every pixel in the image. This of course takes vast amounts of information, especially if the image contains millions of pixels! A different process for drawing electronic images is the 'vector image'. The information within these files is encoded as [fill the area between coordinates *a*, *b*, *c*, *d* with colour X] or [draw a line 10mm think between coordinates *a* and *b*]. This technique is able to draw large and complex images with the smallest amount of information. Of course if you want to represent something detailed and colourful such as a photograph then using a raster image would be preferable, but if the image is schematic and linear then using a vector file to represent it would save the need to write out information for every single pixel.

- Now imagine you take a vector image and change a single coordinate or colour: the effect on the image as a whole could be radical. Only a few specific changes would alter the image entirely. However, doing the same to a raster image, such as by changing only a few pixels out of several million, would have no affect whatsoever on the overall image.
- I don't quite understand where you are going with all this.
- In general we will be discussing smaller, specialised points, such as this one, which seem insignificant or pointless, and the reason for this is that, as I mentioned at the start of our discussion, they will all come together to help us see and comprehend the world around us. We are trying to fashion a tool with which to view ourselves in a new light, and we need to understand this tool before we can use it. All these disjointed explanations are different parts of that tool; they are a way of understanding some small part of the larger picture.

- Now, let me explain the relevance of what I was just talking about: these vector images are like recipes because they *describe* the cumulative process needed to make something. This is also how genes work: they describe how to build a body in terms of manufacture, and not in terms of individual parts (which would be like baking bread with instructions telling you where to put every individual grain of flour!). As with recipes and vector images a single change to one gene can have disastrous and far reaching effects on a variety of processes within the body. For example, imagine that at conception the gene which mirrors the second half of your body were

missing; this is only one small change but it results in the inability of the body to even begin growing.

- In terms of genes the changes I keep mentioning are called mutations. These mistakes in the genetic code arise for any number of reasons, such as ultraviolet light, chemical exposure or errors during cell division when chromosomes are copied. However, for our purposes it is not important to know how or why this happens, we only need to know that these mistakes *do* arise, that they arise frequently, and that their effect on the organism which they build can range from entirely negligible to extraordinarily radical.[6]

- Natural selection is the self-perpetuating process which exists through the hereditary passing on of genes through birth and death, and through the arising of change due to genetic mutation. It is perhaps best if we start talking about natural selection by setting up a simple example where we can observe it at work. Imagine, then, that we are studying a population of simple organisms. These organisms move about in a constant search for food, they reproduce asexually (to keep the example simple) and have a lifespan of say one month.

- Firstly notice that the lives of such organisms are facilitated by their genes because without them there would be no movement, no need for food, no reproduction, no lifespan and no interaction with the environment. All these processes are made possible by the genes which build and regulate the organism. In our example the

gene pool of the population is very monotonous: the organisms' genes are *almost* all identical, and thus they all look the same, move in the same way, eat the same food, and have similar lifespans. However, due to minute differences in their genes resulting from mutations some of the organisms are able to move slightly faster than the others.

- Now, for whatever reason, there is a sudden food shortage and many of the organisms begin to die of starvation. A small number, however, manage to survive better than the rest of the population due to the fact that they are capable of slightly faster movement, and are thus able to reach scarce food first. The fastest organisms eat well and are able to reproduce the most, passing on their genes to their offspring, including the genes which bestow the faster movement. After many generations all the slower organisms have died out, passing on their genes less and less, and the entire population now consists of only the fastest moving organisms.

- The small differences in the genetic make up of an organism work like the changes in a vector image or a recipe: they can alter nothing at all, or something very important, and this change can either be beneficial, such as moving faster, or harmful, such as crippling movement altogether. Those organisms which inherit beneficial genetic changes reproduce, that is, pass on their genetic information, *more* than those that inherit no changes or harmful changes.[7] Thus a population, as the sum expression of its gene pool, gradually changes over many generations by

acquiring beneficial changes and losing harmful ones in relation to its environment. This is the process of natural selection.

- It is not only movement but absolutely anything at all which can change in an organism through mutation. Our hypothetical creatures have many aspects which determine their reproductive success rate: lifespan, size, energy requirements, competitiveness, coordination, sensory capabilities and so on. A small change in any of these could potentially be beneficial or harmful to reproductive success, and the more successful the change in the gene which brings about that trait is at causing the reproduction of its host (and thus its own replication), the more prevalent it will become in subsequent generations (thus the vehicle analogy before). Now you can see, for example, how ancient horses in central Africa evolved over thousands of generations into long-necked giraffes by responding to the environmental pressure of having an abundant food source high up in trees.

- However, these changes are cumulative and not instantaneous: we are talking about a process which operates slowly through hundreds of thousands of generations. It may very well be that a gene pool does not change at all for a hundred generations, and that then only one minute change occurs. This, together with the fact that mutations can affect almost anything and bring about almost any consequence, is the randomness of mutation. The process of natural selection, on the other hand, is anything but random. Even though it has no end goal, no ultimate aim towards which it is working (because it has no intentionality), it still operates in a linear

manner because it follows, by its very definition, the fundamental rule: 'those genes which replicate more often will spread, and those that do not will disappear.'

- If you look at your physical body you can see these selected changes, these *adaptations*, everywhere. In fact, we don't even have to consider *how* certain features are beneficial; instead we can simply reflect on the logic of natural selection and the hereditary nature of genes. What I mean is this: every genetically caused feature of an organism which is not a new mutation but an integral part of the gene pool must have come to be thus because it was somehow beneficial to the replication of the ancestors of that organism, otherwise it would not exist today. You now have eyes and hands only because having eyes and hands was beneficial to your ancestors; if it had not been then your ancestors would not have reproduced, in fact would not have existed at all, and you would not be here today. Your body is thus a collection of the best genetic mutations of the past, where 'best' means that they produced the most replicative success in the environment they existed in. Without the process of natural selection there would be no physiology at all: no genes, no bodies, nothing.
- But surely there are traits which are not beneficial, like the appendix?
- That is true. There are traits, called vestigial traits, which prevail in the genetic code because they were once beneficial and useful to our distant ancestors, but have over time become redundant and are now simply copied from one generation to the next. We can think of these in the sense that they are still here now because they do not *harm* replicative success, for if they did then they would have been passed on less and less and thus would have disappeared from the gene pool entirely. When

considered logically it would go against the very nature of natural selection if some significant trait, something which obviously has an effect on replicative success, were to spread through the gene pool if its effect were negative. This is by definition an impossibility, and thus requires that a trait which *has* spread through the gene pool in the past to have provided some replicative benefit to its host organism.

- There is also an important difference between saying 'everything is an adaptation' and 'everything is the result of some adaptation.' Vestigial and other unexplainable traits are not adaptations, but they *are* the result of adaptations somewhere in the history of our species, otherwise they would not exist today. This same principle also applies to what is commonly referred to as 'by-products': even if something exists as an indirect result of an adaptation, it is *still* a result of that adaptation, and thus *still* exerts either a direct or indirect effect on the replicative success of the organism. At the end of the day every aspect of an organism somehow influences replicative success, and thus influences its own further existence as part of the gene pool.
- But what about something arbitrary, such as the shape of the human chin?
- A good point. But would you agree that there are very ugly chins, and very beautiful chins?
- I guess so.
- Then you have just admitted that the shape of a chin has some effect on the perceived attractiveness of potential sexual partners, and thus the reproductive success of a person. There is perhaps very little *survival* advantage for males in

having a strong chin, yet due to the forces of sexual selection in our past, most females would consider a strong chin to be attractive, and a weak chin, or no chin at all, to be less attractive, and this thus affects mate selection, and the replicative success rate of the chin. In this way we can always find that a trait influences either an organism's survival value or sexual selection value, and that it thus affects replicative success in some way.

- Now that we have discussed the physical aspects of our selves and of our heritage we need to make a small 'leap'. This leap involves applying the before mentioned logic of natural selection not only to our physicality but also to our mentality, namely: *the way in which we think*. Firstly I want to make it very clear that here we are not concerned with *what* people think, i.e. the individual thoughts and ideas that we have, but instead with the process of thought itself, that of consciousness, being, existence, feeling, and all those things.
- And this is where our discussion about decision-making fits in?
- Yes, but now we go further: we need to examine the whole process from a different angle; before we examined '*how* do we make decisions,' now we will look at '*why* do we make decisions,' and specifically '*why* do we make them in this way and not some other way?'
- I had a feeling that you were leading us this way and I have reservations about where we are going. How is it possible that genes have anything to do with our minds or our consciousnesses? Even if it is true that genes create our physical

bodies, what evidence do you have that genes affect our mental processes, or let alone create them?

- In fact there is much evidence for this.[8] But I do not want to press you with countless examples and experiments; instead I want to go about this topic philosophically, using science only when needed.
- If you wish, but I have heard that humans share ninety-nine percent of their genetic information, yet I know of no two people who are mentally the same, does this not show that genes have little or no effect on our mentality?
- Ah, and do you know of any two people who are *physically* the same?
- …no, that is true.
- You fail to see the point here: you are stuck staring at the individual trees and therefore missing the forest entirely. Even though no two people, save for identical twins, are physically similar, they all have similar characteristics! We all share the common human shape, we all have two arms, two legs, two eyes, a torso, hips, toes, fingers, ears, a brain, and so on. How many people do you know who lack these things?
- I know there are some.
- Yes, but that is due to accident, or genetic mutation.
- Then I know of none.
- And there are none because we all share the same genes, as you said. Our differences stem from a few modifiers, exactly like in the recipe or the vector image. *Fundamentally*, however, we are all the same.
- And you are suggesting that this also applies to our mental processes and behaviour?

- Exactly. Just as we all have arms and legs, just *different* arms and legs, so too do we have the same mental capacities and abilities, only that the *subject and extent* of these is different. A while ago we talked about how we make decisions, and you did not even question my assumption that we all *do* make decisions.[9]
- But of course we all make decisions!
- Then how can you doubt that this capacity, which comes naturally to all of us, is anything but genetically caused?
- Perhaps it was learnt when we were young?
- Very well, and what of the process of learning itself? Did we learn that too?
- …no, I guess not.
- We take many of our mental faculties and abilities for granted and consider them normal because *everyone* has them; it takes an effort to see these ordinary everyday things as abnormal and strange.[10] We must now make this effort in order to better understand ourselves. A stone the size of our head cannot learn, cannot think, cannot manipulate ideas or project into the future, nor can it do any of the other wondrous things we are able to do naturally; there is *something* about us humans which makes us capable of all these things.
- I suppose you want to say that this 'something' is genetically caused?
- Exactly. But this is not a strange thing to say! We *are* genetically created. If it were not for our genes we would not exist! As you just mentioned: we *are* all ninety-nine percent genetically similar, then why would we not consider something we all share as genetic?
- I don't know… somehow the thought unnerves me.

- You are not alone. We all cling desperately to the notion of a permanent, unchanging self whose capacity for freewill is at least to some extent beyond external influence. We need this to confirm our autonomy, without which we are not ourselves, would not exist. If our genes can have an effect on what we think and do, then what is to say that anything we think about or decide upon was caused by our own freewill? This, however, is really a question of 'where do we draw the line?', or 'where do we make the division?', and the problem arises out of the fact that we *are* drawing lines and making divisions at all instead of seeing that those two things which we are trying to divide are merely the same side of one coin.
- What do you mean?
- By drawing a line I mean the division we try to make between *instinct* and *free-will,* (or our ability to make choices). An instinct is genetically caused and something we have little control over, such as wanting to get away from painful stimuli. Freewill and choice and decisions and self and consciousness, on the other hand, are placed upon the altar of sanctity and worshiped as things unknown and unexplainable, and absolutely unrelated to the dirty and low influences of "genes". It is almost considered vulgar to suggest that our worship of these things is a mistake and that instead of being holy they are simply a step further in complexity than instincts, but still of the same origin, still based on genes.
- And that is what you are suggesting?
- Yes, it is. But before I can show you how this is so we need to first examine and understand our basic mental traits and instincts.

- Mental traits we all share in common, such as learning, deduction, projecting into the future, and values, such as preferences for warmth over cold, for certain types of food, or of wanting to get away from things that cause pain,[11] are all the result of evolutionary pressure on our ancestors,[12] much in the same way our physical traits are. In us, like in all other species, these traits were selected for[13] because they enabled our ancestors to survive and thus reproduce more often. This is a touchy subject for some as the notion that mental capacities, abilities and values are genetically caused is either offensive or, as you said before, unnerving. This is, however, due to a misunderstanding: it is not being claimed that your thoughts are predetermined in your genes, that having thought X at such and such a time was going to happen anyway; instead what is being said is that the *ability* to have thoughts is genetic, that it is the framework in which those thoughts are created and in which they exist that was selected for, and that because of our evolutionary heritage we as humans are *predisposed* towards certain thoughts, desires and actions, just as other animals are towards other things, because having such dispositions has until now resulted in replicative success for the genes which caused them. And we can *see* this in the similarities between humans across all cultures.

- Let me elaborate here on what I mean by predispositions. We can think of simple life, such as that of unicellular organisms, as the expression of an input/output system: an organism has a sense, such as the photoreceptivity of its skin; a process which takes in this information and sends out an appropriate output; and finally some sort of reaction system which turns this output into action, such as

movement. This simple example describes the way in which certain light sensitive bacteria move. Such a system can take on many forms: for example the seed dispersal systems of some plants have a spring loaded seedpod which when touched open explosively to disperse the seeds into the surrounding environment. Input, output. Another example: the leaves on a tree are heliotropic in that they follow the sun with their broad upper side using chemical reactions to create specific movement: the system "senses" the direction of the sun and causes the leaf to move perpendicular to the sunlight. Input, output. In animals this system becomes more complex: it can include numerous senses to pick up information, a nervous system to convey it, vast numbers of mental systems in the brain to process it, memory which stores important information, and various ways in which to enact the result, such as through vocal sounds and movement.

- Each of the individual parts of any one system was adopted by natural selection because when put together they improved the replicative rates of the organisms which the system governed. It is the *relationships* between input and output, no matter what form they take, that are selected for. This is because *they* bring about some effect or result (such as moving away or toward sunlight) which ultimately affects the organism's replicative success (such as evading an enemy or producing more food).

- In humans these systems can be found in various places (such as the reflex arc of the central nervous system) but are predominantly located within the brain where they

exist in the form of intricate and complex networks of neurons.[14] As with other parts of the body, the brain, and each of the neurons it is made up of, develops and responds to external influence by following genetic instructions. With this I do not mean that genes dictate every aspect of our brains, but instead that each human brain has the same shape and the same individual sections, such as the prefrontal cortex or temporal lobe, which are used for the same purposes in each of us, such as obtaining sense data or processing it. How much these sections are used, and what shape the neuron networks take, is of course different from person to person and dependent on their past experiences.

- Exactly how the brain works is not important to us right now: we merely want to describe how it functions as best we can, and as simply as we can, with what we know. And what we know is that something goes in, and something else comes out, and that this happens predicatively, meaning that there is a rule being followed. Now, with this I do not mean we have rules in our heads, instead I mean that whatever happens in our heads *can be formulated* as a rule following system, an algorithm. And these formulations are what I call modules, which look like this:

Module {	*If* X happens	→ Input
	Then do Y	→ Output

- The inputs and outputs of these systems are varied, but in terms of humans we can list a few of them:

Input		Output
-Sight -Taste -Touch -Hearing -Smell -Memory -Chemical release somewhere in body -Nerve signals from organs -Information received from other modules	← *Relationship* →	-Movement -Vocal sound -Memory -Chemical release in the body or brain -Nerve signal to other parts of the body -Information to be used by other modules

- For example, a simple module might be '*If* pain is felt somewhere on the skin *then* move the body part away from that location'. This is a *description* of the customary reaction we exhibit in response to something which causes us pain.
- I understand the example, but even now I sense that this explanation is avoiding a serious question, namely *who* is experiencing the pain? You are hopefully not suggesting that the module feels the pain and then reacts to it?
- No, I am not, and we will get to this shortly because it does need to be examined and explained. What I am describing here is how things work *overall*, but as you noticed simply having this description does not say anything about the notion of self and where it comes from, nor does it account for the complex behaviour in higher life forms like ourselves. This is indeed the direction we want to take, but in order to get there we will need to add several more layers to this story yet, so be patient. The first of these layers concerns the roles pleasure and pain play in these

modular systems. In fact, where we are about to go we might call the search for the birth place of value itself.

- Imagine the following: after applying a local anaesthetic to your hand you intentionally place it on a hot stove. The nerves in your hand would no longer be able to transmit the signals normally caused by burning skin, and thus you would not feel the expected pain. Without the feeling of pain you do not react as you normally would, such as by pulling your hand away.[15] This tells us, and we need to say this even if it is obvious, that the skin itself creates various signals, such as if there is a cut, burn, stroke, or what type of pressure and so on, and that these signals are sent to the brain via the nervous system. Without these signals there can be no reaction (or if there is then it must come from some other input, such as sight), which is really a tautology: it is impossible to react to something you cannot sense. Simply put: our behaviour is a response to what we sense.

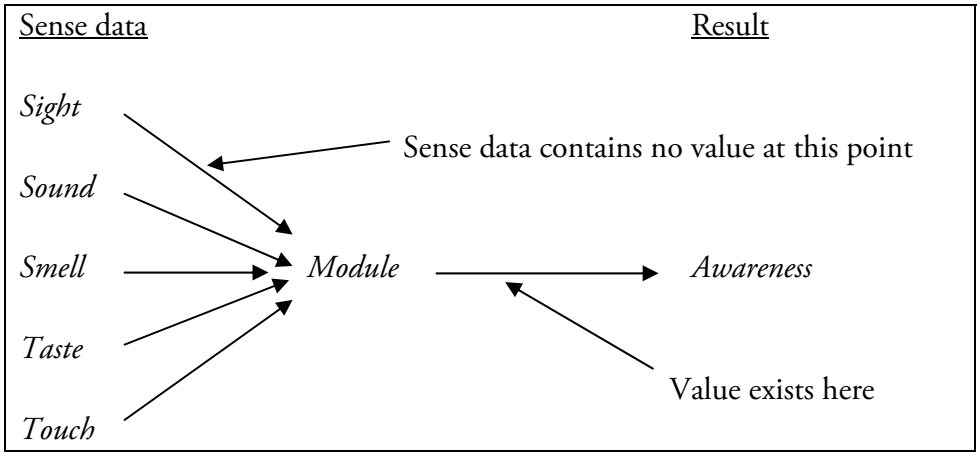
- Now, what does this simple fact of biology tell us? It tells us that all perceivable information is born in the senses and then flows to the brain. Yet at its conception this information is valueless, that is: it has no positive or negative value attached to it, it merely *is*.
- But how do you know that?
- Because of the differences between people. A masochist who gains pleasure from hurting himself, for example, experiences positively those signals which others would experience negatively, even though the sensory information sent by the

senses is the same in both cases. Here we can see that people place different *value* on identical sensory information. In addition it is possible for us to change what value we place on sense inputs: something which had previously been seen negatively would now be seen positively (or vice versa), even though the sense information itself has stayed the same. This shows us that sensory signals are valueless before they enter into the brain, are more or less the same between people, and that only once they are combined in the brain as a sense object do they gain value and become either positive or negative.

- What exactly do you mean by sense object?
- I mean the combination of the properties of sense information. For example, when we listen to a piece of music we are aware of its rhythm and of the pitch of each note, and we are also aware of if it is quiet or loud, and the combination of all of these are what we perceive as the music. Or take a visible object, such as a tree or an apple, which we perceive in our minds as one object although it is made up of various shapes and colours which all depend on our position and on the quality of the light reflecting off it into our eyes. This is what I call a sense object (although I may at times simply say sense data or sense information to mean the same thing).

- Now we want to find out *where* value is created or added to these sense objects. Before the sense data enters into the brain it has no value, it is just a signal that something has happened. However, when we become conscious of it, it has somehow become either good or bad, positive or negative, and thus somewhere in-

between these two occurrences an automated process has attached value to whatever we sensed, *before* we become aware of it.



- The addition of value takes place in the modules which first accept and process sensory information: in fact the process *is* the addition of value. Let me illustrate some simple modules so that you can see what I am referring to here:

    If

    Sensation of burnt skin on hand is received,

    Then

    1. Initiate withdrawal reflex: jerk away hand from current location (muscle movement set off by nerves in the spine),
    2. Attach 'burning pain' signal to sensory perception and send to consciousness.

- Here we need to think of consciousness as a collective communication area for modules: signals are injected into a common area so that all modules are able to

pick up on them. (Many things happen outside of consciousness and are processed by automated systems). Imagine a computer: the programs doing all those millions of calculations, all hidden; the only information displayed on screen is large, collectively grouped, necessary information. Imagine the computer having some predetermined aim instead of someone controlling it, and many of the programs only being able to communicate with each other through what is shown on the screen as they try to achieve this aim. Consciousness is like an internalised version of that screen, only it isn't a stage, there is no audience, no one home; it is instead a place where communication happens between all the different processes. Thus the burning pain signal released by the first module triggers other modules:

If

Burning pain in consciousness,

Then

1. Move head to fix eyes on object which caused pain,
2. Remember visual input of object,
3. Associate input with pain (this is the birth of a new module: neurochemicals which produce fear will be emitted next time the visual cue is seen, and memories of pain and what happened will be recalled).

- And:

If

Burning pain in consciousness,

Then

1. Seek out running cold water,
2. Place burnt skin under water for 15 minutes

(This module was not instinctive but learnt: the information was taken in and used because it is beneficial. This point will become very important later on.)

- And:

If

Burning pain in consciousness,

Then

1. Released tears from tear ducts,
2. Enact customary vocal response to pain (perhaps swearing in adults, crying in children).

- As modules release signals into the consciousness others are activated and proceed with their own processes. Some of these are automatic and happen totally outside of our awareness, and these are most probably the genetically caused modules, while others are learnt *ways of doing something*, such as the example of putting your burnt finger under running cold water. All of this works much like a computer program where there are inputs, such as key strokes and mouse clicks, which result in specific outputs, such as light patterns on the screen and sounds from the speakers. All of this works because a programmer has written the relationships between input and

output in such a way that it *achieves a specific purpose*, and in this very same way natural selection has created rules and relationships (modules) in the brain which bring about specific results because they ultimately have a positive effect on natural selection's aim: replicative success.

- I can see how this might work with lower life forms, but we humans are consciously aware of making decisions, and we do not always follow such impulses. Perhaps what you are describing could be some sort of underlying foundation for how we work, but I feel as if there is a lot missing.
- I *am* suggesting that this is the foundation. As for the things that are missing we will get to them in time. For now let us finish this layer first.
- Then I want to point out that this explanation of modules is still missing any sign of real value.
- But we are close, and it is important that when we find value that we tread carefully as it is easy to stray off the path here: it is important to see value objectively. For the most part humans are wired to see the value of things in a subjective, standardised way. For example, it is normal for us to prefer a warm room to a cold one, which is why we heat the rooms we live in. This normalisation of values, of preferences, was directed by natural selection towards a certain end, that of replicative success, and achieved in that we all share genetic information from common ancestors. The values we automatically apply to our environment could easily have ended up some other way: it could have been that living in the cold, or having our skin burnt, was conducive to the reproduction of our ancestors, and if that had been so then those with a disposition towards these things would have reproduced more and we, as

their descendents, would now come to find these things as good and wholesome instead of agonizing and painful. Thus when we think of something as 'good', we tend to think of it as we, within ourselves, see the notion 'good'. We might find taking long baths or eating apples good, for example. But others might not consider these things good, indeed might loath the idea of bathing or eating apples. What I meant by 'seeing value objectively' is that we need to resist the inclination to sink back into our customary subjective view of things; to see value objectively we need to think of it as an *indicator* and not as either 'good' or 'bad' as we understand these things in our everyday lives. Having a positive signal attached to something is not *good*, it merely signals something, much like a yes or no answer to a question signals something.

- And what does it signal?

- It signals the following:

Positive Signal (Good)	Negative Signal (Bad)
Do it again	Don't do it again
More	Less
Want it	Don't want it
Keep it	Throw it away
Seek it	Keep away from it
Get into this situation	Get out of this situation
Etc.	Etc.

- Such positive or negative signals are attached to sensory inputs when they are processed by modules, and they create either attraction or repulsion behaviour, just like the poles of a magnet. Specific sensory information causes certain modules to

release particular chemicals and this is what we then "feel" as positive or negative. Other modules then pick up on these and cause appropriate output responses.

- But why are you referring to them as signals? Why not simply say they are like reward and punishment? That certain sensory inputs are desirable because they are conducive to replicative success, as you say, and that we are rewarded for these through the release of certain chemicals?

- That is exactly what many do say: it is quite common to hear people say that feelings are the rewards and punishments of a motivational system which is used to get us to do specific things, to make us behave in certain ways However, this is not enough because the question "*who* is being rewarded?" is not answered. All we are really doing with such explanation is submitting to our natural introspective inclination towards a dualistic account of what we feel and who we are. It is impossible to clarify all this by dividing ourselves into body and mind, by simply saying that all these inputs and modules and the rest are all circling the undefined "self" which *feels* and desires the rewards and fears the punishments which all come from physical changes in the brain. This doesn't help us at all because it does not explain *how* the self feels these things; it does not explain what we mean when we say that a chemical causes us to feel good (to accept this explanation you would need to already know what "feeling" means). In the end there needs to be another self within the first self in order to explain how feeling can exist. This sort of explanation, however, begets an infinite regress, and in the end does not explain anything.

- Then what does?

- We really need an explanation which does not rely on this undefined self, an explanation which says 'Pleasure is a signal from modules to indicate to the rest of the body that something of positive value has been done, and that it should be done again.'
- But *who* or *what* receives this signal!? It seems you are simply exchanging one term for another.
- Very well, I have been avoiding this question for some time, perhaps I ought to try and answer it now.

The old man, with a look of doubt on his aged face, takes a deep breath and continues.

- I am not sure about all of this, about the things concerning the self. However, I will try to explain how I see it. Firstly, observe that feelings themselves are put into your consciousness and that you have no control over their creation or of their effect. Let me show you what I mean with an example. Make yourself comfortable and close your eyes, now try to imagine yourself in the following situation:

> You are walking along a busy street. There are people everywhere: shopping, eating, talking. You are carrying a large porcelain vase. You suddenly trip and drop the vase, smashing it. The sound of the breaking porcelain is heard up and down the street. Everyone turns to look at you, they start whispering, children are laughing and pointing at you. Your adrenaline kicks in, you are

embarrassed, your face turns red, your brain quickly starts considering options for solving the situation, how to get out of here with the least amount of attention.

- Can you imagine such a situation?
- Yes, clearly.
- Can you also feel all the different emotions rising up inside you?
- I can feel them.
- Perhaps you've been in a similar situation before?
- Not with a vase, but I have definitely been embarrassed before.
- In fact I would hazard the guess that we all have. And therein lies the first indication of what we are looking for, namely that all humans, no matter what race or culture, can comparatively empathise with specific situations and feelings. But this is also true for a vast list of other emotions: we all feel fear in dangerous situations, we all feel attraction when we see beautiful people, we all feel pain when we are physically hurt, or when we lose a loved one, we all feel indignation when our partner cheats on us, we all feel anger when we are insulted and so on. In fact even the facial expressions we express when we feel each of these specific emotions are identical between all races on earth. Of course, the individual faces which show these emotions are different in shape, size and colour, but every person who feels happiness has the characteristic lifting of the cheeks, the upward turn of the mouth, the uncontrollable urge to laugh and so on. And we can assume that everyone who experiences this emotion also shares in the internal feelings associated with it, that

gladness in the chest, that need to share their happiness, that feeling of 'everything is ok' and so on,[16] even though their mentality may be different.

- It may be true that we all experience certain emotions in the same way, but I can think a few examples where people do not feel the emotions you described: celibate monks who do not feel attracted to beautiful people, or thrill-seekers who feel no fear in dangerous situations.
- Ah, but notice that in such cases the people have undergone training which accounts for this deviation from the normal state of being. And this is always an uphill battle to overcome the *natural* condition, such as for the monk, who was born with a natural inclination towards attractive people. The point is that these natural inclinations (our feelings) are our heritage as humans; we can see this in the similarities between people the world over because identical sense inputs produce strikingly similar feelings in all of us. To refuse to accept this is like making a huge point of the differences between all the various faces of the world, all the while being blind to the fact that *they are all faces*, that they all have the *same* features, which just happen to have different shapes and sizes. This means that even if our notions of what defines beauty are different due to differences in upbringing and culture, we still feel attracted to people who *we* feel are beautiful. The *same* feeling is still there in all cases.
- I see your point.
- Good, now let us go on. In the situation I described before you felt emotions and feelings arise within you in response to what you were experiencing, correct?
- Yes.

- Now I want to ask you: was it that you observed the situation, the street, the people, the children laughing, and in response consciously *chose* these emotions to arise of your own free will?
- …no, that happened automatically.
- Would you then have been able to suppress these emotions?
- Perhaps not I, but others surely could, such as actors or comedians who are used to such situations.
- You miss the point: suppression indicates that the emotions come from outside of our selves; that we have no control over their creation, and that is what I'm trying to point out here. You are right, of course, suppression of emotions and feelings can be learnt, or trained, as we said before, *but the very creation* of emotions and feelings is outside of our control.
- If you make that distinction then it does seem to be so.
- It is absurd to think that feelings come from within ourselves; that we *willingly* call on them at particular times because we *first* wanted to do something. Instead it is that the feeling came, and *then* we felt as if we ourselves had chosen to want this or that. The relationship between sensing something, such as an object, and feeling something, such as gladness, must have come from *somewhere*: it is impossible for it to have just appeared suddenly, as if out of thin air, much in the same way our fingers or our eyes did not just appear one day and *by chance* be incredibly useful tools which furthered our survival. These relationships which create feelings are instead adaptations like any other, and this applies to *all* feelings because the system as a whole is the adaptation, and anything within that system exists through and

because of the system. Yet every day we say "*I* am feeling happy," this is "*my* feeling" and so on; it is not normal for us, in most cases, to think "this feeling is causing me to do something, yet I did not ask for it."

- What I have said so far is that certain environmental stimuli sent to the brain through our senses trigger automatic modules which use chemicals to produce feelings as signals to cause us to perform specific actions. But there is a problem here: when we look a little closer we realise that a feeling requires someone to experience it, and a signal requires a receiver.
- That would be us, consciousness, the self?
- Well, no. Here we have come to the root of the problem (and this is where your question comes in) - how does this "receiver" receive these signals? Does he "feel" them too? All our explanations at this point are simply more duality, and if we try to explain anything with it then we have explained nothing at all. Instead we need to ask the question: "I know my body is flooded with specific chemicals when my brain obtains certain sense data, and these chemicals produce specific actions, behaviour, movement in my body… *but what am I?*" We essentially have an automated input and output system, but cannot describe what is between the two. What does it mean to "feel" these emotions? What does it mean to say that we "wanted to act in that way" if our actions were merely triggered by chemicals, which in turn were caused by environmental stimuli?
- I don't know.
- But you see that there is a problem?

- Yes.
- Then that is what we need to solve. The symptom of the problem is that philosophers, scientists, psychologists, and everyone else cannot agree on what is correct. They each present hypothesises which are based on intuition, experimentation and observation, and which all seem to solve, or at least explain, our problem in some way. However not one of these ideas has ever resulted in people declaring "this is it" and then going home; none have succeed in explaining everything satisfactorily, even though they all seem plausible.
- We would expect that they sound plausible if they are based on intuition, experimentation and observation!
- That is a good point. However, these explanations are also all based on an assumption: a preconceived notion about what is true.
- Didn't you mention this before, when you said that we all see things through a specific worldview based on observations and assumptions?
- I did. And I also said that by dropping these assumptions we are able to start anew and see how things really are.
- So you think there is a common assumption in all the different theories we have about the self?
- Exactly, and it is from this that our problem stems, and also why we cannot seem to agree on any one theory. We have already discussed this assumption today: do you recall when I said that you had unintentionally used the words *I, me, mine* in a description of desire and action?
- I remember.

- My point there was that we unknowingly use words and ideas which are based on our intrinsic natural sense of duality, and that this perpetuates the assumption that there *is* this permanent feeling, thinking autonomous self inside each of us which takes in the inputs and spits out the outputs and feels emotions and feelings and has freewill in making decisions.
- But that assumption is based on introspection and empirical observation, it is based on our *experiences*!
- But these merely describe *how things seem*, much in the same way we once assumed that the sun moves about the earth simply because it *seemed* to be so. And even science can be dead wrong at times, because experimentation itself is observed and interpreted by us.
- So we can never be sure about anything?
- No, we can't. But we can try to build upon certain things. I'm not saying that where we are going with this is completely correct; I'm merely suggesting that we can do better than what we have.
- Are we heading towards Descartes?
- Oh, nothing as drastic as that. Here we accept some observations: we accept logic and natural selection and all those things, and we build upon them in the hope that they are right, and that they will provide us with a better explanation than our current one. But Descartes is interesting, because he was an enthusiastic participant in this whole mess.
- Do you mean *cogito ergo sum*?

- Yes, but it would have been better if he had said "cognition therefore existence" and not "*I* think therefore *I* am." His intention was to provide some sort of footing for empirical experience, and thus he had to inject this simple statement with the assumption that there was not only existence, but also an 'I' that existed and thought and felt. This assumption was simply based on his, and our, personal experience that there *is* this self that thinks and feels. And it is this assumption that is at the root of our problem. We have not defined this 'I', we merely assume to know what it is: everyone has one, after all! We simply point and say "that there, what you are now, what at this very moment is feeling, seeing, thinking, that is *you*, that is a 'self,'" yet we run into trouble whenever we try to explain it or describe it. This is the same difficulty early astronomers had when they tried to explain the retrograde movement[17] of planets because they clung desperately to the assumption that we lived in a geocentric solar system. It was only once someone challenged this accepted assumption, an assumption that was obviously true to everyone at the time, that things started making sense. But this was and is not an easy thing to do: people are much more inclined to look for and accept explanations which can coexist with how things seem than get rid of the assumption altogether.
- I suppose you would want to get rid of it?
- Yes, I would, because then things would become a lot clearer. I would begin by driving out this assumption of a real existing self with a last ditch attempt at actually finding it. First it seems to be everywhere, because it is obvious, but then we start seeking in one place and cannot find it, then we hunt it elsewhere, but it is not there either. It seems as if it is always one step ahead, always hiding in the places

we plan to look, but never being there. In the end, after having thoroughly searched every possible hiding spot, I believe we will be left standing empty handed, and it is only at this point in time that we will realise that the self never existed in the first place. This elusive self I am referring to is the normal, average, everyday notion of the self; the idea people on the street have of who they are, what they are. It is that which we refer to when we say "*I* think" and "*I* feel." Essentially this self looks like a soul or a spirit sitting in our heads, like a person within a person, a mind within a body. It is the first response given when asked "*who* is feeling those chemicals in your brain?" I am not saying that there is *nothing*, no self at all, no consciousness, because as you so rightly observed there *is* existence, and feeling, and emotion, and thinking and all those things. I am only trying to show you that these things are not happening *to* the little person in your head: they *are* you. There are no two layers. No dualism. And I am trying to show you how this is possible, how we can see how all this works without needing to resort to some mystical self or soul to explain what seems unexplainable.

After a pause the old man continues:

- This assumption I keep speaking of, this natural notion of a separate self, the inherent dualistic feeling we all share, is born within each of us because of the way we are physically and mentally constructed. We are all genetically identical, more or less, in terms of functions and structure, much like all cars have wheels, an engine, seats and so on, regardless of their make and model. And this is also true for our

mental selves: do you see that we are all in possession of the introspectively created notion of a conscious self which thinks and feels and has freewill, and that this notion is strikingly similar from person to person?

- Yes.

- Then we must admit that it is in some way genetically caused. And here is where we enter grey territory. I want to say the following with emphasis on perhaps. *Perhaps* it is like this: your body is not just 'one body' which does this and that, it is instead a body made up of thousands upon thousands of parts, even millions depending on how small you want to go, and all these parts act in unison to enable the body as a whole to do certain things. Yet we only ever see and feel ourselves to be this 'one body'. I believe this is also true for our mental selves: there are thousands upon thousands of parts (millions of neurons) creating thousands of modules, all working in unison to do the things we have been talking about here. And in the same way that unison creates the illusion of one physical body, so too can it perhaps create the illusion of one separate individual mental self. Any genetically caused module or mental faculty would *have* to synchronise well and get along with every other part if it wants to be replicated. Thus harmony is a property which would promote replicative success for any trait, and perhaps with enough depth and complexity even perpetuate the illusion of a single self.

- We can see this illusion partially break down in people who suffer from conditions such as Alien Hand Syndrome. AHS sometimes appears after undergoing a corpus callosotomy, which is carried out to relieve the symptoms of epilepsy by surgical

severing of the connection between the left and right hemispheres of the brain. People with AHS are able to feel normal sensation in their hands and consider them to be their own, yet they report that one hand 'has a mind of its own' in that it moves and manipulates objects without their consciously willing it to. It is thought that AHS results when different parts of the brain that are engaged in the control of various bodily movements are disconnected from one another and from the rest of the brain. As a result these different regions of the brain are still able to command bodily movements, but no longer generate the normal feeling of conscious volition involved in movement. In effect different parts of the brain now work independently of one another, thus losing the effect which unison created.

- We also see how physical changes to different sections of the brain (through drugs or injury or illness such as cancer) can cause radical changes in our behaviour and our sense of self. Depending on the location of the change we may become angry, happy, sad, confused or any number of other emotions in situations and at objects where before we would have acted normally.[18] However, in these situations we are swept along with the emotions: we may, perhaps, take note that this is not how we normally behave, but we go along with the emotions regardless, enter into them, *become them*. If a brain tumour were to push on a certain section of your brain causing you to become excessively angry then *you* would become angry. What you wouldn't do is behave as you would without the tumour and say calmly "well, there is this anger rising within me but I have no idea where it's coming from." Instead you would scream "I am angry!" because your sense of self, your reasoning, your

decision making, is all caused by the physical state of your brain, and the different processes found therein.

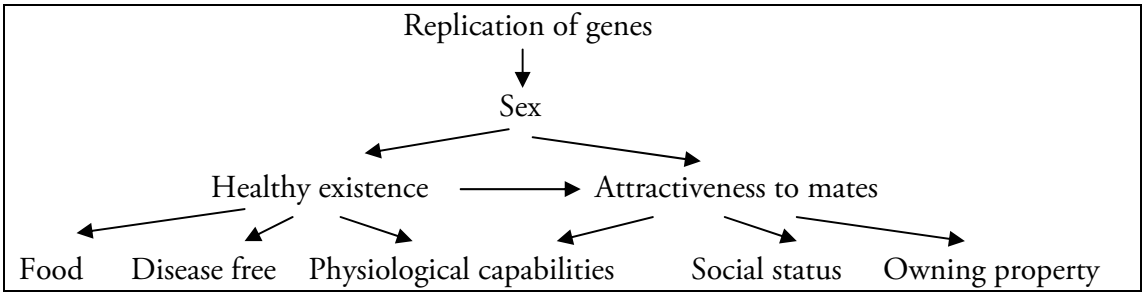
- Although this is by far not the whole story, I do believe it offers an explanation to some parts of your question.
- So you are saying that the value signals that enter into consciousness are signals to… everything?
- That is what I would say.
- And you think this is true?
- Listen, I'm throwing my hands up and admitting that I don't *know* for certain if all this is true! It seems this way to me because it is logical and rational and in accordance with what we know about ourselves and our pasts. Heaven only knows if it's actually true. Perhaps it is good practice for philosophers to admit from time to time that they are not sure… and right now I am not sure!

The old man laughs, but his laugh quickly turns into a rasping cough and is silenced. The younger man gets up and fills a worn metal pot with water, which he hangs into the fireplace.

- Perhaps things will become clearer if we continue on with the story, so let us get back to the point where we were searching for value. I believe I was about to explain the following: genetically caused values, which exist in all of us, and in all other living things too, dictate behaviour by providing a sort of 'sense' (a sense *about*

sense data), of what is good and bad, of what should and should not be done. These positive and negative signals are used, for example, to make food which is appropriate to an organism's needs taste good (meat for a lion, grass for a horse, berries for a monkey), to make warmth preferable to cold (but also finding too much warmth uncomfortable), to guide our social interactions (ants find communal structures to be good, while other insects may find solitary life better), to create tropisms in plants (turning towards sunlight, growing against gravity) and so on. We could call such values 'instinctive primary values' because they form the foundations of life by providing an organism with goals towards which it can act,[19] values which were selected for because they were conducive to the replicative success of the organism which used them.

- These primary values form a pyramid shaped hierarchy and are ordered by their importance going down the list, with replication of genes being the highest and most important goal, and all other goals simply being intermediate steps towards achieving this. Sex, or whatever form of reproduction an organism uses, thus becomes the ultimate aim of life because it is the process by which genes replicate. For us humans a few of these values would look roughly like this:



- Each step in the list is also a prerequisite for the next step up. Health is required in order to be attractive to a mate, and this in turn is required for sex, which is required for gene replication. Of course this list is by far not exhaustive; in reality it is far more detailed and complex than what I have described here.
- But if sex is the ultimate aim of life then how do you explain people who willingly chose not to participate in it?
- Primary values are ordered a certain way within genes, but this does not mean that they remain ordered in this way forever: the level of importance and thus the ordering of values can change throughout our lifetime. This can happen when we rationally believe that valuing something specific will eventually help us attain our aims. For example, it is quite possible for a person to be sexually attracted to an unhealthy partner, if in such cases there is some other quality which the partner possesses that is of benefit (i.e. intuitively attractive), such as power, wealth, or intelligence. This is the reordering of values *under* sex. Moreover some values can, on occasion, become even more important than sex: that is, become reordered *over* sex in the hierarchy. Remember the celibate monk from before: for him the benefits of heaven (continual existence and permanent happiness) are of greater importance than the immediate rewards gained from sex (the feeling that something 'good' is being done), even though he does not realise that he is predisposed towards valuing these things only because they would, if he were to eventually pass on his genes, lead to and be indicative of replicative success.
- But by adopting this value order he has effectively destroyed his genes' chances of replicating! How is it possible for him to do that if his ultimate aim in life is to

reproduce and pass on his genes? Wouldn't we expect such reordering to become extinct because it obviously does not cause its own replication?

- These are two different questions, and they need to be answered separately. We will discuss your second question later, as it concerns the transmission of values. In regard to your first question, however: notice that the reordering is not found within the genes, but within the mind. This new order of values (expressed in the precepts of his religion) perhaps fulfils all his desires ordered *under* sex, such as wanting a long, healthy life and continuous happiness (which he believes he will gain in heaven), but it has also negated, through his belief in celibacy, these desires from further causing what they were designed to bring about: genetic replication. Consider what you would do if you were shown that by adopting a specific value order (placing importance in certain things) you could fulfil all your worldly desires.
- I would probably do it.
- What if doing so also meant that your genes could no longer replicate? What if it meant you could never have children?
- I would consider it more closely, but I don't think it would make any great difference.
- And that is because of the disconnection between your genetically caused desires and the goal they are supposed to attain. The problem is that desires are only *aimed* in the direction of genetic replication, they are not directly connected to it: the genetic desire which causes you to eat food does not know that the *reason* for making you eat food is so that you can ultimately pass on your genes. When you say you would accept all your desires fulfilled at the cost of never passing on your genes,

your desires, *which are caused by your genes*, are unable to make the connection between their existence and their purpose, and they, through you, agree to the deal because they only want themselves fulfilled, and do not care about any further goal. It is the *consequence* of fulfilling a desire which generally causes some further goal to be achieved, not the fulfilment of the desire itself.

- Well, can you show me an example of this?
- That is very simple: contraception. The desire which causes you to want to have sex, and the desire which causes you to use contraception (not having the burden of dozens of children) are disconnected from their ultimate purpose (to create children and pass on genes) which is why you can satisfy both without any conflict arising.

- There are instances, however, where ordering some desire *over* sex in the importance hierarchy will actually increase replicative success. For example, parents will often sacrifice everything for their own children (even their own lives) *because* they have already replicated their genes in the form of their children and must now protect those genes so that they too can replicate again. In this way you can see that sex itself is not necessarily *always* at the top of the hierarchy: instead whatever brings about the most replicative success becomes most valued.

- What happened to the monk was a 'rational mistake' in that a belief influenced the ordering of values in a negative way (replicativly speaking). Now let us look at an example where such a mistake occurs on a deeper level, beyond the confines of rationality. You will recall that before I spoke of pain as being a signal which

indicates that something is happening, something that potentially could have a negative impact on our existence, and ultimately on our replication. The avoidance of such pain (being pain free) is a value which is very high up in the hierarchy: it is the value which causes us to avoid certain negative situations, and therefore feeling pain at those times results in better replicative success. Sometimes, however, this changes. Masochists who actively seek out pain as a form of enjoyment have deviated from the normal ordering of values and now find pain to be pleasurable. In these cases the sense data itself is still the same as before: the body reports that something is happening, yet the report does not contain value. The modules which accept this sensory information, however, *have* changed, and now instead of sending a negative value signal as they normally would they send a positive one, and thus the masochist continues what he is doing because he feels it is good and desirable.

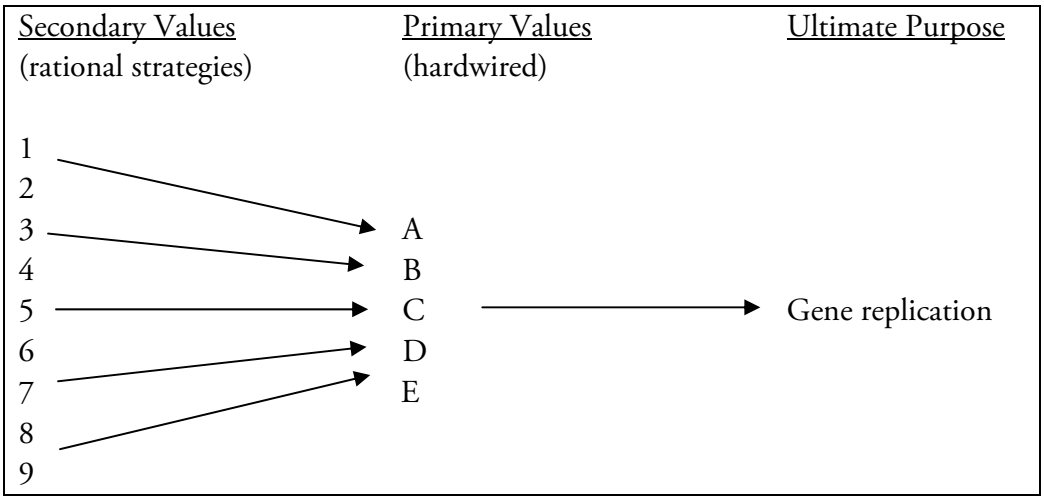
- There are many reasons why this can happen (and not only with pain, but with almost anything at all): a person may be shocked into changing their values, or the change may come about through training, or as a coping mechanism. However, it is not normal, statistically speaking, for such a drastic (high up) change to occur: most people live out their lives according to their genetically given value order, using it as a guide to determine what should be done, what is good and bad, and how to react to something. And for what *normal* reason could we change this primary ordering? We have no other, higher, more important values to go by, no other values to tell us in which direction to change! How could we permanently change the feeling that

warmth is better than freezing cold? There are few higher values which could cause such a change.[20] The pain felt from being exposed to freezing temperatures is a base feeling, there is nothing above pain which can tell you whether pain is good or bad because the very definition of pain is 'bad'. If the pain caused by something were seen as intrinsically good (that is: not as good for some other reason, but good in itself) then it would simply be good, not pain. It is only through extraordinary (although not always obvious) circumstances that such deviations from the normal genetic value ordering can occur.

- These were the first few layers of the story, and now we come onto a layer which is exclusively the home of higher forms of life. This layer I call learning, and by that I do not mean rote memorisation but instead the ability to create and emulate secondary modules and values in order to achieve primary ones. To 'emulate' here means to hold and utilise non-permanent modules and values, much like running a piece of software on a computer. Primary hardwired modules are genetically caused, and almost set in stone, whereas secondary modules are those we create, modify and remove throughout our lives. Simple organisms lack this ability: they follow rigid modules regarding food, environment, reproduction, interaction and so on, which generally never change. Bacteria will always behave in predictable ways: they will always eat certain foods or move away from certain chemicals. Such simple organisms lack the capacity to create and follow any other rules/modules/values; they cannot imagine doing anything other than what they were built to do. We, on the other hand, are adaptable in that we have the capacity to conceive of and follow

strategies (modules) which allow us to achieve some important primary goal. This ability allows us to emulate modules which are relevant to our current environment, and is thus an overall strategy for better replicative success by doing something natural selection is entirely unable to do: real-time value creation. Higher life forms have evolved this capacity as a way to fulfil primary desires in response to their immediate environment, and this capacity was continuously selected for, causing it to become multifaceted and complex, because it greatly increased an organism's replicative success rate. For example: there is a primary module which causes us to avoid pain, yet we *learn* that a hot stove causes pain when we touch it, and thus a module is created which causes the avoidance of any further touching of stoves without testing them first. A simple organism could not do this and must rely instead on its primary values to guide it through life, i.e. touching stoves over and over again. Natural selection cannot provide an organism with values to indicate whether such things as hot stoves are conducive to replication or not. This is because it can only change organisms in relation to environmental factors which are permanently present, or at least present for many generations, and stoves are not prevalent enough, nor have they been around for long enough, to provide any evolutionary pressure.

- To put it concisely: secondary modules, values, and desires are part of a system which develops rational strategies aimed at attaining some hardwired primary value, aim, goal or desire, and these in turn *all* exist in order to bring about gene replication:



- Many organisms express this type of learning to some degree. For example, dogs can be "taught" that certain behaviour will produce a reward, and other behaviour will bring punishment, and thus they emulate these rules (the behaviour) in future because they wish to fulfil their primary values (such as getting food, or avoiding pain). Another example: a monkey can learn that by solving puzzles set up by an experimenter it will be rewarded with food. Thus the next time it is hungry it will solve these puzzles again because doing so previously brought about the fulfilment of a primary desire (to eat). We could adjust the strength of this behaviour by fulfilling the primary desire to a greater extent, such as by providing very delicious food, which would cause an increased determination to solve the puzzle. These modules, these *ways of doing things*, can in some cases be passed on to other organisms if they have the ability to communicate, and to emulate what is being communicated. In fact this is a very interesting aspect of this ability, and I want to look at it more closely later on.

- Let us carry on. Imagine you arrive in a room and someone asks you to take a seat in front of a desk with a button. You are told to press the button when you see a red light flash, and not press the button when you see a green light flash. With this information you emulate the modules:

    If

    Sense data equals red light

    Then

    Press button (according muscle movement)

- And

    If

    Sense data equals green light

    Then

    Do not press button

- And you wait until you see a flash of light and act accordingly. We would not say that these modules are now a 'part of you' like the modules governing food and sex because, unlike genetically hardwired modules, you will probably forget the emulated modules once you leave the testing room as they are of no further use to you. However, what if you were required to fulfil this test for a long period of time, such as for work (think of production line workers)? What if you were rewarded

somehow for successfully completing it, such as by being paid, or by getting something you want? With such repetition an emulated module can become internalised, taking on a role much like that of the primary modules. By doing some action over and over again we become accustomed to it and get better at it, as if the parts of the brain used for the action were somehow muscles which get stronger every time we use them.[21] This is how we learn and become better at skills, such as playing an instrument or solving maths equations. It is also why, after some time, we gain pleasure from repetitive tasks and routines: if you are doing something, and you keep repeating it, then evolutionarily speaking it cannot be harmful because otherwise you would have stopped doing it. It is better to do something over and over again if it is somehow beneficial, and thus natural selection favours a tendency towards repetitious behaviour.

- But there are so many activities we humans partake in which are in no way conducive to our survival, yet we seem to gain satisfaction out of repeatedly doing them.
- That is true today, where our survival is not determined by our actions, where we are free and *safe* to indulge in all sorts of pointless activities (pointless in an evolutionary sense). But this was not true for our ancestors, who were forced to literally make a living by their actions. If one of our distant ancestors had decided to sit around all day playing solitaire then, in that environment, such behaviour would have constituted an immense waste of time, time that could have been spent obtaining food or respect from others (which were conducive to survival). In this way pointless activities would not have been repeated in our ancestral environment

because they would have negatively influenced the individual's quality of life by wasting time. Of course, if the activity had provided some skill, or if it was played with others to create a bond between members of a tribe, then it would most probably have been repeated, as these are conducive to survival. Activities were chosen in this way for repetitive application because they brought about some benefit. However, nowadays all manner of activities are encouraged and undertaken irrespective of their influence on replicative success.

- We can almost always find some reason to explain the emulation of seemingly pointless activities. You might have learnt to play the piano because your parents forced you to and you wanted to avoid their wrath, or you play now because you are admired for your skill. However, sometimes we emulate modules and behave in certain ways when there is no obvious reward at all. In these cases it seems that we achieve some unseen primary value, such as relaxation, or simply gain pleasure from some mundane activity because we are inclined to solve puzzles in general, which is a good mind-set to have if you are an organism which tends to survive by solving puzzles. The more complex and indirect our abilities get the more chance there is that they will get used for pointless activities (such as playing solitaire) which natural selection did not intend them to be used for.

- By emulating modules we are able to link together causal chains to fulfil our primary values: instead of always trying to achieve something directly we might come up with a strategy of achieving it indirectly, and with a better result or less

effort. Or emulating a module may even be required to achieve some primary value which is completely subjective, and can only be fulfilled by current, here and now means. For example, status objects play an important part in communal relations in almost all cultures of the world, however *what* constitutes a status object is different from place to place and from time to time. You would look quite stupid with a horse drawn carriage and driver in the middle of modern day New York, but you would look rich and powerful if you were chauffeured around in a limousine. The point is that the causal chain of goals is the same regardless of what time and culture you happen to find yourself in:

> Get status object (secondary value) → Get status (primary value) → Get mates → Have sex → Gene replication.

- I wonder how the owners of limousines in New York would react to your suggestion that they only have them to get more sex!
- What they think is irrelevant: it is their actions we are interested in! But it is true that most of them probably did not buy a limousine with the *direct* intent of having more sex. Causal chains are not necessarily completely in one's consciousness: one may simply *feel* a desire for something, such as whatever the current culture dictates as being a status object, and be completely oblivious as to where the desire comes from or why it is there, much like all those feelings you felt when you imagined you broke the porcelain vase. And the point here is, as I said before, that once the desire

for a certain value appears we accept it as our own, as *ourselves*, and follow through with it without asking any questions.

- Of course, at other times the causal chain is broken, or might not have been laid out correctly, and in these situations it is not always that something has gone *wrong*, as much as it has merely gone differently. For example, a rich and powerful person in New York may have been brought up with ideals of charity and humility, i.e. that these values are good and should be achieved, and he now fulfils these goals with certain actions, such as by *not* buying a limousine or being driven around in one. The process, however, is identical: the desire to achieve what is *considered* good is still appeased, it is merely the placeholder values that are different.

- This whole system, as I said before, is by no means perfect; yet you must admit that the ingenuity of it all is astounding. Instead of giving each of us a standard set of absolute values to follow throughout life, natural selection has given us a few primary values and sent out into the world to make up our own secondary ones, which of course means that we are adaptable to almost any environment or situation. We can see the results of this adaptability in the various cultures of the world. In each culture the most important aspects of life, such as food, shelter, sex, safety and so on, are identical (due to the common genetic heritage), but the way in which each culture achieves these aims is as strikingly varied because the members of the various cultures have over time adopted and utilised different strategies in order to adapt to their own immediate environment.

- Now let us carry on to the next layer. I have used the word "desire" for a while now, but have never really explained what I mean by it or how and where it fits into this story. Firstly, desire needs to be seen as a constant need to fulfil something, to bring about something, namely the things dictated by our values. To visualise this I have found an excellent analogy. Do you recall as a child ever playing with a wooden or plastic box which had holes shaped in the form of stars and circles and squares in all of its sides, and blocks that were shaped like the holes which you had to put into the box? In this analogy the self is the box with thousands of holes, and each of these holes represents a module (a gate), and the blocks are the incoming sense data (the keys). Desire is the empty hole which constantly needs to be filled: we are always trying to fill the hole with sense data, fix it, close it off, but are never able to because the blocks keep falling through. When the appropriate sense data triggers a module it causes the release of a chemical signal (feeling), and it is this feeling which briefly fills the hole, decreasing the constant pressure caused by it, and in turn abating our craving for a short while.[22]

- Desire arises out of the absence of value (thus the analogy of a hole). Hunger arises from the absence of food, the desire to alleviate ourselves from pain arises because pain is the absence of health, and so on. This is the cruellest joke natural selection has ever played on us because desires are by their very design unfulfillable. If a desire were to be permanently fulfilled (a sealed hole) it would then no longer cause the behaviour and actions it was designed to generate; we would no longer seek those things (sense information) that fill it, which are also the things we need in order to

survive and reproduce. For example, if you were permanently satiated you would no longer seek out food and eventually starve, or if you no longer tried to alleviate yourself from pain you would die of illness and burns and broken bones.

- But after a meal I no longer desire food; I *am* satisfied.
- Ah yes, but only for a while, and only because eating *more* food at that moment would be harmful. It is so with all desires: we fulfil them and for a while we are left in peace, but only until they rear their heads once more and we must run and satisfy them all over again. This peace, what we call happiness or pleasure or the absence of pain, is what we are really searching for. In this way we are constantly running, always seeking out situations, acquiring things and behaving in certain ways in order to obtain the sensory information which will abate the desires and bring about a pause from their pressure.
- But I am sure some desires go away once they are fulfilled. For example, if I desire to buy a car, and I end up buying one, then my desire to buy the car would disappear.
- Well, actually you desired to *own* a car, which you satisfied through the act of buying one. The desire for ownership is now constantly being fulfilled while you are in possession of the car. Just imagine if it were taken from you; the desire for ownership would become apparent again because it is no longer being fulfilled. Of course some day, for whatever reason, you might lose the desire for owning the car, and at that point you wouldn't care if you were no longer in possession of it (but you may still want to be in possession of its worth, which is why you would then sell it instead of throwing it away).

- Although we are unable to simply wish a desire fulfilled whenever we feel like it, we can and do cheat with the sensory requirements: we watch pornography and get aroused although there are no real people involved, we add artificial sweeteners to food and taste the sweetness even though there is no real energy content, and we are even able to imagine situations and events in our mind, made up or remembered, and feel emotions about these as if they were real. In all these cases and in many more we are effectively tricking the modules in our brains to follow through with their programming without ever having to supply the sensory data (by behaving in certain ways) they were set up to obtain.

- In fact, the closer we look the more we realise that our entire lives revolve around tricking our modules, that this has in fact become the pastime of humanity. We begin with day dreaming, imagination: a sort of self gratification where we envision in our minds (by means of fake sense data) situations and occurrences to whichever end we desire. This is shared in song and word and written text to be recounted over and over like a reusable drug. Then we get to television which effortlessly recounts such stories more accurately in sight and sound than any imagination can. Why do we cry during emotional scenes in films, and become scared during frightening ones? It is because our modules cannot tell the difference between real and fake sensory inputs. Why are males more likely to watch horror films? To prove their courage? Computer games go one step further: now we have control over what we sense. In modern online computer games we can even live and interact with other human beings. No wonder so many people of every age and culture are

becoming addicted to these games: they *are* life, or at least an imperfect imitation of it, but an imitation in which the players are gods in comparison to their normal mundane existence, now able to do battle, or travel, or tread fearlessly, no longer hindered by the real world ailments of flesh and mortality. Or consider team sports, an age old pastime, which is merely simulated tribal warfare where people are able to cheer on their own home-tribe. All these genetic modules, all these desires, all being fulfilled in ways they were not meant to be fulfilled in.

- Recreational drugs, on the other hand, are a means of bypassing the need for specific sensory stimuli altogether. Through them we either directly input desirable chemical signals into the brain, or trigger their release. In the end we are all chemical junkies, the only difference being that those of us who shun pleasurable drugs are taking the long road by first seeking out the sensory inputs required to gain a fix (food, sex, shelter, community, family and so on) while drug users are simply cheating the system entirely.

The pot hanging over the fire gently begins to boil. The younger man throws a small handful of tea leaves into the water. He then sets the pot and a small cup in front of the older man, who quietly watches the steam rise from the water's surface before continuing:

- I now want to head into a different direction and look at something which I personally find very interesting. A short while ago we compared secondary emulated

modules to strategies aimed at achieving some primary goal. In fact modules in general, whether hardwired or emulated, can be referred to as algorithmic problem solving rules or strategies designed to solve a particular problem. Our genetically hardwired modules are ways of solving the problem of achieving specific important aims, such as food, shelter, staying away from pain and so on, which are necessary for our survival. As such these were evolved (selected for) by natural selection to this end. Secondary modules, on the other hand, we create ourselves in a process called learning by emulating a *way of doing something,* a strategy or method by which to achieve a certain aim. And this aim is always a 'step' in a chain of aims ultimately intended to bring about a primary goal, such as in the hierarchical flow diagram I described to you earlier. For example, a primary goal may be to eat food, but *how* we achieve this will change depending on place and time. Thus we develop strategies appropriate to our circumstances, and we keep and utilise those methods we believe are best at achieving their intended aim, either because we have deduced that they are from experience, or we have been told that they are. To put it in simple terms: we are given hardwired aims to achieve, but not the methods by which to achieve them, and thus we must create these ourselves. It is the *method* of achieving an aim, whether caused by oneself or another or the environment, which is judged and assigned quality (and also why we do not question the quality of our own desires, at least not until they impinge on other desires). These emulated strategies to achieve certain aims are what I call *ways of doing things*, and they permeate every aspect of our lives; in fact whenever you think of something as

having quality, as being good or bad, you are judging a strategy on how well it fulfils a desire.

- We also adopt and utilise larger collectively held strategies developed by many people, generally from the culture we were brought up in and interact with. A collection of these strategies, these *ways of doing things*, when bundled together and adopted by a group of people become the cultural traditions, customs, religions, technologies and languages of a population, and are then passed on from generation to generation. Let me show you what I mean: can you tell me why we build houses?
- To have somewhere to live in I suppose.
- And why do we need that?
- To have protection from the weather, and from outside dangers.
- Shelter, then. And almost every culture has some sort of house they build, and if not then they certainly seek shelter in an already finished house, such as a cave or something like that. It seems that shelter is of significant importance to human beings, a primary goal.
- It seems to be so.
- Notice that in every culture on earth people have built their house in a similar fashion according to their cultural customs, and that these designs are derived from and adapted to the surrounding environment. In Africa they built houses out of branches and mud, in the Middle East out of sandstone, and in the Amazon out of vines and trees. The houses of the individuals in each culture are built using an identical process. This process, this *way of building a house*, is a tradition treasured

by the culture and handed down from one house builder to the next. Its origin is the human need for shelter, which was first appeased by using caves and later in simple wooden structures. New discoveries were made as each generation in each of the different cultures of the world built houses: perhaps a new material was discovered, or an innovative type of insulation was developed, or a different way to process a material was found. All these discoveries were incorporated into the body of knowledge known as *the way to build a house* if they provided some positive effect, such as making the building process faster, making the house stronger, keeping the house warmer, or cooler, that is: *appeasing the desire for shelter in a better way than the previous piece of knowledge*. There are small revolutions we can see even in our own history of house building: nails are used today because when they first appeared they made everything a lot easier, and made the houses sturdier, and the use of the plumb-line resulted in straighter walls, and thus in safer and stronger houses, which is why it is still used today.

- In fact every addition and change to this body of knowledge must have somehow had a positive effect on house building, otherwise it would not have been passed on to the next generation of builders or spread throughout a culture.
- Are you suggesting that we enact some sort of natural selection on knowledge?
- That is exactly what I'm suggesting, and not only with building houses, but with *all* knowledge. These huge bodies of grouped knowledge (like giant guide-books) are collectively held in the individual minds of the people who make up a culture, and each of these bodies is a *way of doing something*, of achieving an aim (such a

building a house), and we are constantly changing and adding to this knowledge as time goes by. It is possible that there are many similar such 'collections of knowledge' held in one culture, but these are simply different paths to the same end, and exist in different forms because people cannot agree on which is the best (perhaps because their opinions differ on what "best" means). We select *ways of doing things* based on if they fulfil our primary desires, and thus the direct values of our genes,[23] and in this way "progress" and "development" are simply the exchanging of older processes for newer ones which bring about some aim better and faster and more efficiently in the current environment.

- This not only applies to strategies which create material objects such as houses, but also to thoughts, and these we can call *ways of thinking about things*. Before I mentioned that stories induce emotions and feelings within us; that we use stories to emulate reality and thus satisfy our desires for specific things, such as love, courage, triumph and so on. (We merely need to look at targeted popular fiction to see how the emotions of romance and love are emulated for woman, and courage and danger are emulated for men). Throughout human history such stories have been refined and selected for their worth in bringing about these feelings, and the stories which were selected were passed on from generation to generation, the rest forgotten. This is one aspect of how stories can have differing levels of quality. Here what the current culture values is what the stories try to achieve in the listener, thus we would expect the stories and songs of Ancient Greece to praise courage and valour in battle because these were the actions which were valued at that time, *and*

they were valued because they brought about the fulfilment of the primary desires in that environment:

> Courage on the battlefield (secondary value) → Fame → Popularity, power and respect (primary values) → Larger selection of sexual partners → Sex → Gene replication

- Notice here that courage is the overcoming of fear: the desire for achieving fame (or victory or whatever) effectively becomes more important than the desire to stay away from harm (pain), just like you could have overcome your desire to 'stay away from pain' in order to eat the cake, if the desire for the cake had been powerful enough (which most probably would have happened if you had been starving).
- But what of the men who still went to war and sought glory even after marrying a wife?
- The causal chain above does not disappear once the end goal is achieved. We generally do not stop desiring sex when the desire has been fulfilled once. As I said before: desires are a cruel joke, they can be appeased for a moment, but they will always return. Thus one still desires to attain and keep fame and popularity even when it is already achieved (just consider modern day celebrities). We have no conscious connection with the causal chains in our minds through which we might realise why we do the things we do; instead we are simply driven on by each desire in a continuous struggle for attainment. We may, of course, for whatever reason, place a lower importance on fame and popularity, but then other things would

become more important instead, which we then would try to achieve with the same vigour.

- Another interesting example of this is language. When speaking a language we follow conventions of word use and grammar: we follow rules. We chose to follow those rules which ultimately best bring about the fulfilment of our desires. That is the selection criteria: that is what we perceive as 'good'. What I mean by this is that we use the words and sentence structures that everyone else uses because doing so enables us to communicate in the best possible way, and through communication we are able to obtain the things we desire. We are, of course, free to not follow these rules and instead make up our own, but in doing so we would no longer be able to fulfil the desires which depend on communication. When our primary desires are fulfilled by following a certain set of rules for communication (a language), it causes the repetition of using those rules within individuals, and causes them to be spread through space (outwards from a cultural epicentre of use) and time (from generation to generation). In this way parents and the wider community, tribe and culture pass on secondary values and knowledge such as languages and customs to the next generation because these values have worked well in the past to fulfil the primary human desires.

- In the end, in regard to everything we do, we choose to do the things we do because we think that doing so will ultimately fulfil our primary desires. And in this same

way we don't do everything we don't do because we believe that doing such things would have a negative effect on our aim of fulfilling these same desires.[24]

- Everything?

- Yes, everything.

- Even when I lift my arm like so?

- Yes, even then. In your conscious mind the causal chain is not fully realised and completely seen for what it is, but that does not mean that this is all there is to it. You do not realise *why* you do many of the things you do. Lifting your arm to disprove what I'm saying is trying to be right about something, and if you were to disprove me successfully you believe you will have won some power over me, or perhaps gained my admiration and my admission that you know more than me (or at least your own). If we now had an audience, and you *did* prove that you are right, and I am wrong, then you will have won some amount of admiration from them, or so you believe. Or it may have been that your desire to be right about what you believe to be true is a strategy of self confirmation: by insisting that you are right you reassure yourself about the *quality* of your beliefs (that they are the best strategies to get what you want), which is better than being in doubt about them. In the end you are lifting your arm for a reason, whatever that may be, and that reason will always be caused by, and be part of, a long chain of desires and actions all aimed at one primary goal.

- Now we have reached the last layer of this story. Do you recall when we were outside in the snow, how you made a choice between the two paths?

- Yes.

- We said that your choice was made based on fulfilling one of many competing desires (the desire to be warm was the reason you chose one path, the shorter, over the other). We then spoke of the varying levels of importance of desires, and how we fill up a timetable to satisfy them. We said that we make choices based on values, what we consider to be good or what gives us a positive feeling (signal), and that the motivation for making choices is the appeasement of desires, like releasing pressure. However, all this still gives us the wrong impression, it is all still infused with the traditional notion of "choice", that we as souls or some mystical consciousnesses freely *choose* our decisions as reactions to our surroundings, even if these choices are based on predefined values. The truth is that it is wrong to say that the sense data comes and *then* we decide what to do, *as if we pull our reaction out of thin air.* Instead we must say that the reaction already existed, waiting for the correct sense data to trigger it. And the reaction *is* the value.

- Imagine two people who both receive identical sense inputs (such as a certain smell), the first reacts with a positive action (likes the smell) while the second with a negative action (wants to get away from the smell). Even though the sense data is the same in each case, the *value* it triggered in each person, the module which accepted the sense data, was different, and the reaction caused by the value was thus also different. Sense data, through value, causes our bodies to react in specific ways, and we, whatever we are, go along with it and say "this is what I want to do!" Perhaps because we *are* that? And if you don't want to do something then you

already didn't want to do it before you thought about not doing it. With this I mean that the value reaction to the sense data was already there: *you were predisposed to that value and that reaction in response to that specific sense data before you became aware of it*. Of course, the difference between reacting positively or negatively to something can depend on very subtle differences in sense information, but there is no "decision making" involved because a decision by definition must be based on something, and each sense datum only has one corresponding value associated with it. It is not possible to find a sense datum both positive and negative at the same time, just as it is not possible for the body to react to one thing in two different ways at the same time.

Through the window dusk approaches, silently shrouding the winter landscape in darkness. The younger figure stokes the embers in the fireplace, filling the room with a gentle red glow.

- Here we have come to the end of our story, and we can now see our predicament: we are cursed to action based on values obtained through millions of years of evolution, with no escape *because any other action would simply be based on another value*. Goethe beautifully expressed this by saying that "In trying to oppose nature, we are, in the very process of doing so, acting according to the laws of nature." And thus I see all that I have told you, this entire story, as both salvation and damnation. We are saved because we see what we are, the way we are, and why we do the things we do, but we are damned because we cannot do anything about it, because we

have no alternative. Many have suggested that we rebel against our genes and make our own autonomous values and goals,[25] but on what should we base these new values? Outside of the values given to us by natural selection *there is no value.* And there is no escape from this predicament.

- I first became aware of this dilemma a long time ago. I held the notion that people who ate sugary food were simply appeasing their basic animalistic desire for sweetness. But then I noticed that to eat healthy, nutritious food was in reality no different from this, because by doing so I was merely subscribing to a different desire (to be healthy, to live longer). I then saw that the *ordering of desires*, the levels of importance of one's desires (resulting from the aim one is trying to achieve), explained all the differences in thought and behaviour between people. Outside of this relative ordering there is nothing to base value on, nothing to say *absolutely* which value is more important than any other. We are given a predetermined order of values at birth which causes behaviour aimed at promoting our own genetic replication, but accepting this aim and its value order is no more right than accepting any other arbitrary aim, such as religion or cultural traditions.

- We can see ourselves act in this way *everywhere*. Consider the obsession many have with "bettering" themselves through physical training, cosmetic surgery, self-help courses, education, diet and anything else we do in order to become better than we already are. In the not too distant future it will perhaps become possible for people to genetically alter themselves and their children to have better physical and mental

capabilities than their normal genes would have allowed. Instead of having to train or learn to achieve ability, they will instantly be granted natural ability. But notice: these abilities would *only* be representative of the values of the people themselves (and their culture), and these values are ultimately based on the values predefined in their genes (such as being strong, fast and intelligent). If in our evolutionary past it had been beneficial to have an inherent proficiency at laziness and unintelligence (if these traits had somehow improved replicative success), then people would now want to alter their selves and their genes towards these aims, and not towards physical and mental aptitude. In all this we can again see our own unawareness of the origin of the arbitrary values which control *all* aspects of our lives. What is the point of changing ourselves based on some arbitrary values that are no more "right" or "good" than any others?

- To consider this point further: imagine you have the power to instantly change any of your genes, knowing beforehand what the changes would bring about. What would you now change about yourself?
- As you just said: I would probably give myself vast physical and mental abilities. Perhaps good looks, and amazing musical ability as well.
- But you could also change the genes which affect your desires for these things. You could make yourself content with who you are right now, with what you already have. Why would you not do that, as essentially it would result in the same thing?
- How would this result in the same thing? At this very moment I don't want to be what I am, otherwise I would not desire these changes!

- And that is exactly what I mean when I say that we are all trapped within the system! Now try as hard as you can to envision what it would be like to stand outside of it, outside of the influence of values and desires. What genes would you change now?
- …I would have nothing to base my choices on. I would not know what to change… I would not want to change anything.
- And that very point, the *view* you have just glimpsed, encapsulates everything we have talked about here.

- I often wonder if it would have been better to have never found out about all of this. If I had just carried on with my life as any normal person does. But then I see that I am making a value judgment, I am using the word *better*, and I ask myself: better than what? What does it mean for one thing to be better than another? I have become stuck asking myself this question over and over. I have begun to see it everywhere: in everything I do, in everything I see and feel and hear, in the food I taste, and the things I smell. I see that every choice I make is without fail based on what I believe to be good, and I see that this concept of good is no more right and no more permanent than anyone else's concept of what is good. And then I sit down and am at a loss: I can no longer do anything without miserably realising *why* I am doing it. In this way I have managed to destroy every possibility of seeing intrinsic worth in something (even if there was never *really* any intrinsic worth to begin with). I have drained my world of colour, and now I am not even permitted to say that this was a bad move because I have lost all definition of what good and

bad mean. I am ashamed to admit it, but I miss the illusion I was living under, and now that I have seen things for what they are I no longer know what I should do.

- Have you come up with any answers?
- Nothing conclusive, but here and there throughout history people have become aware of this problem. For instance, I have discovered that the ancient Buddhists knew this, or most of it at least, but that their original message has now been lost under a mountain of mysticism and religious clutter. Still, if you manage to sift through all of that then their ideas and what you can take from them are similar to what we have discussed here today. Perhaps it is good if we look at this a little more.

- Buddhism, the non-religious kind, states that it is senseless to try to maximise the good and minimise the bad because this is what we have been trying to do all our lives anyway. The secret, Buddhism says, is instead to step outside of the notions of good and bad entirely; to see that good and bad values are simply two sides of the same coin. True contentment comes from letting go of desire altogether, regardless of whether it is desire to get something (positive) or to get away from something (negative).[26] There are no *good* desires, even if they are universally seen as positive, and no *bad* desires, even if they are shunned by everyone: there is only desire itself. By letting go of desire altogether, by not reacting to it, by not saying *I* want this or *I* feel this, we initiate the dissolution of the self. But it is important, says Buddhism, to see that there never was a real self to begin with: it is the illusion of a real permanent self that is dissolved. (If you recall we discussed how this notion of self we all possess is created. I said that it was something akin to an illusion, something

which *seems* to be as we perceive it, but which in reality exists nowhere, and is only an effect created out of our composition, the way in which we were built to operate.)

- However, according to Buddhism, understanding this notion is merely a stepping stone as it doesn't bring about any change by itself. Even if we see the desires for what they are, we are still bound by them. Breaking free from this bondage[27] is achieved through repetitious practice (like learning a new skill, a strategy). In Buddhism this practice involves the observation of desire and the realisation that desire is impermanent, that it ebbs and flows like the tide, always arising and dying away, and that the "self" is created when importance is attached to the aim of fulfilling desires as they arise. Normally when we become aware of a desire we convulsively attempt to bring about its fulfilment, and in doing so we create the notion of "I" and "me". By practising the letting go of desires, by becoming accustomed to letting them pass without attachment and action, we reduce and moderate the overwhelming power that desires have over our lives.[28] Once this has been achieved to any extent we enter a sort of empty space, a nothingness, what in Buddhism is called *Nirvana* (translated as 'fully blown out' like a candle, or emptiness, or non-existence), a state where desires no longer cause actions, where we no longer *want* anything, and thus do not enact any strategies (either primary or secondary) to achieve anything. This is what is meant by "being content".

- This notion of diminishing the power desires have by becoming accustomed to resisting or ignoring them is not necessarily exclusive to Buddhism. But in the end Buddhism has been the only philosophical approach to realise that *all* desires are part of the same system, and the only one to suggest that in order to attain true contentment we must leave the system entirely.

- But I hesitate when I consider this closely. To me these are all simply more value filled ideas, all this tranquillity, peace, happiness, contentment and so on. They are still only positively seen goals which we try to achieve, and I fear that doing so is missing the whole point! It is probably true that we would become content and all that once we let go of our desires, but we need to realise that these states of being are only desirable *when seen from within the system*. Outside of this internalised system one state is no better than the next: it *cannot* be because outside of value there is no value, and thus nothing exists to base preference on, and without preference there can be no cause for wanting to change who and where we are.

- Then again perhaps I am misusing the word contentment. Perhaps the contentment of the Buddhist *Nirvana* is not the same as our normal conception of the word. Perhaps being outside of the system is not actually so desirable, and perhaps those who have travelled there would tell us that it does not bring what we now consider to be contentedness and happiness, because these notions have no meaning when seen from such a state.

- But still, the question is that if we know this whole story from the start, what non-value based reason do we have to attain any other state of being? What reason do we have of wanting to bring about any form of change? Thus we are forced to say that one value, desire, action or state is no better than any other, and you are what you are, with what you have, where you are, and this can change, or it can not, and in the end everything is absolutely no different from everything else.

- There is nothing more to say here, and I think it is time for me to take my leave. For now I will let you think about what we have discussed here, *and to try to see these things in your everyday life.*

With this the old man gets up, puts on his coat, and disappears through the door into the darkness of the night, leaving the young man to silently ponder his words in front of the smouldering fire.

Endnotes

[1] Hume (1777) claimed that reason is a slave to the emotions (desire). However, I would be inclined to use the word 'tool' instead of slave, as a slave without a master is free, yet reason without the guiding force of desire is lost entirely.

[2] In the *Protagoras* (Taylor 1991) Plato denies that anyone willingly does other than what he believes to be best.

[3] Dennett (1991 p.172) writes that "unlike most explanations in science, evolutionary explanations are essentially narratives", narratives which tell the story of who we are, where we come from and why we do the things we do at every moment of our lives.

[4] Environmental cues play a part in our early growth. It is thought, for example, that certain environmental cues can influence an earlier onset of puberty. However, the important point I am trying to make here is that without genes there would be nothing whatsoever.

[5] The 'Selfish Gene' theory developed by Richard Dawkins (1976) states that the ultimate aim of life is not group fitness, or even individual fitness, but gene replication. In this sense it is a reductionist view of natural selection.

[6] The term "effect" here means the *change* from what was supposed to happen according to the coding of the parent genes before the mutation and what in fact happened to the next generation in terms of how they were built differently.

[7] Hereditary traits are not intrinsically good or bad: what makes them so is their interaction with the environment and how this interaction affects their own replicative success. Thus a trait may have a positive effect for many generations, but then become negative due to changes in the environment or changes in the species (such as sexual selection). Such negative traits are then slowly weeded out as more positive traits arise to replace them.

[8] One need simply look at the various well documented and often disastrous affects genetic disorders and brain injuries can have on the mental processes and sense of self of those who suffer from them.

[9] "The differences between humans are caused because we acquire different beliefs, attitudes, and values, not because we are genetically different" (Richard and Boyd 2005, p.55).

[10] Famed 19th century psychologist William James wrote that "it takes... a mind debauched by learning to carry the process of making the natural seem strange, so far

as to ask for the *why* of any instinctive human act" (James 1950, p.387). I believe this to be an essential attitude when trying to understand our own behaviour.

[11] These values or preferences "are best thought of as affect-laden intuitions, as they appear suddenly and effortlessly in consciousness, with an affective valence (good or bad), but without any feeling of having gone through steps of searching, weighing evidence, or inferring a conclusion" (Greene and Haidt 2002, p.517).

[12] The idea to treat behavioural traits as anatomical organs was first developed in 1937 by Konrad Lorenz. With later advances in genetics and evolutionary psychology it became clear that to treat behaviour as a phenotype was not only plausible, but necessary.

[13] The term 'selected for' should not be misunderstood as implying intention. This also applies to words such as 'designed' and 'developed' which are used freely to imply the direct yet completely aimless process of natural selection.

[14] "In short, the circuits of the brain are designed to generate motion -behaviour- in response to information from stimuli in the environment. The function of your brain is to generate behaviour that is appropriate to your environmental circumstances" (Cosmides & Tooby 1997).

[15] Although the withdrawal reflex found in the central nervous system is largely responsible for this reaction, in this case we could say that the stove was only so hot that it caused pain after some time, and that thus the action of pulling the hand away was a reaction to the perceived pain, and not a reflexive reaction.

[16] If we were to take a census of all societies, however small, in the history of the human race and deviate from the anthropological ideal of mapping differences by instead mapping similarities, we would find a myriad of behaviours which are present throughout the scope of human society, despite complete separation of populations by migration (Wright 1994, p.7).

[17] This is the observed optical effect of a planet travelling across the night sky, slowing down, moving in the opposite direction for a short time, and then turning back again to move along its original path. The effect is caused by the positioning of the planets in relation to the earth as they circle around the sun.

[18] It is also possible to lose the ability to feel emotions altogether. Several neurological studies have been conducted regarding the relationship between damage to specific parts of the brain and moral reasoning. One of these studies asked subjects with damage to the ventromedial prefrontal cortex (VMPC) to consider moral dilemmas which pitted the "greater good" against an action that is normally highly aversive. The results showed that individuals with damage to their VMPC, which causes many

emotional responses (feelings) in healthy human beings, would consistently choose the utilitarian option when they were asked to solve these moral dilemmas (University of Iowa Health Science Relations, 2007). The subjects were able to 'save ten by killing one' because they no longer felt any emotional response to the thought of murdering an innocent (a primary value), yet knew that saving ten people was better than saving one (which is a reasoned secondary value).

[19] Various attempts have been made to list the basic human desires (in this regard the term desire is interchangeable with value). For example, Steven Reiss (2000) used the information gathered in numerous studies (collectively involving more than 6,000 people) to develop a theory which suggests that there are 16 primary desires guiding nearly all of human behaviour. These desires are:

- Acceptance, the need for approval
- Curiosity, the need to think
- Eating, the need for food
- Family, the need to raise children
- Honour, the need to be loyal to the traditional values of one's clan/ethnic group
- Idealism, the need for social justice
- Independence, the need for individuality
- Order, the need for organized, stable, predictable environments
- Physical Activity, the need for exercise

- Power, the need for influence of will

- Romance, the need for sex

- Saving, the need to collect

- Social Contact, the need for friends (peer relationships)

- Status, the need for social standing/importance

- Tranquillity, the need to be safe

- Vengeance, the need to strike back

According to Reiss people differ in the strengths of each of these basic desires. As a whole the list represents those intrinsic desires that directly motivate a person's behaviour (primary desires), and are not aimed at indirectly satisfying other desires (secondary desires).

[20] It is theoretically possible that, for example, the value of staying alive, because it is of greater importance (i.e. higher up in the hierarchical flow diagram) could create such a change if one's life were dependent on experiencing coldness as better than warmth. However, such drastic changes could only occur in extreme cases, and even then it would be difficult for high level hardwired values to be altered to such an extent.

[21] Synaptic plasticity is the ability of our neural circuits to change over time, allowing us to learn and form memories, and ultimately change the way in which we move and think. These circuits are built and modified through a process where those

synapses that are active and actively changing through repetitive use are kept, and those that are not are lost.

[22] Intracranial brain stimulation involves implanting electrodes into specific parts of the brain. When a small current is passed through the electrodes the subject reports that they feel good, and when handed the electrode's controls they generally just keep pressing the button to activate the current, again and again, sometimes a thousand times in succession (Phillips 2003). In this case pressing the button effectively bypasses any sensory prerequisite and results directly in the release of the modular signal that something of positive value is being done, which is why the subjects keep pressing the button.

[23] "Genes hold culture on a leash. The leash is very long, but inevitably values will be constrained in accordance with their effects on the human gene pool" (Wilson 1978, p.167).

[24] Dawkins (1976) writes that ultimately the consciousness is at all times following the rule "do what is best with the information available" (p.60). This, he believes, is because as brains become more highly developed they will ultimately be given full control by the genes to behave according to the single overall policy instruction "do whatever you think best to keep [the genes] alive" (p.60). However, Dawkins fails to explain *who* this executive control has been handed over to, nor does he realise that

"whatever you think is best" is *still* indirectly determined by the genes, so that in the end nothing significant would have changed anyway.

[25] Dawkins (1976) writes that "Our brains are separate and independent enough from our genes to rebel against them; we do so in a small way every time we use contraception. There is no reason why we should not rebel in a large way too" (p.332). He asks us to "teach altruism and generosity because we are born selfish […] because we may then at least have the chance to upset [our genes'] designs", (p.3) and that we are able to "rebel against the tyranny of the selfish genes" (p.201). Keith Stanovich (2005) calls for us to "define our own autonomous goals" (p.xii) instead of accepting the goals of our genes. Robert Wright (1994) believes that "[Self realisation] is the first step toward correcting the moral biases built into us by natural selection" (p.376). and that understanding natural selection can help us "choose which goals are worthy" (p. 10). George Williams (1989) simply refers to natural selection as "the enemy" (p.208).

[26] Ajahn Chan (2002), a famous Theravada Buddhist, writes that "The teaching of Buddhism is about giving up evil and practicing good. Then, when evil is given up and goodness is established, we let go of both. [Buddhism] is the path to transcend both of these things" (p.291).

[27] Christmas Humphreys (1958), a Buddhist scholar of the early 19th century, provides a concise description of the Buddhist view of the human condition: Man is always attracted by the pleasant and the delightful, and in his search for pleasure he runs after five kinds of sense objects; cognizes ideas and clings to them. He little realizes that no amount of forms, sounds, smells, tastes, tangibles and mental objects or ideas will ever satisfy him. This search is what is called *Samsara* (the wheel of existence)… Desire supplies the binding force to hold to the wheel of existence, its nearest Western equivalent being Nietzsche's Will to Live (p.91). The continuous drive for existence, this "Will to Live", is the most important of primary desires, and is continuously perpetuated by the repetitious fulfilment of other desires.

[28] In 1890 the psychologist William James wrote that "The way to success is by surrender to passivity, not activity. Relaxation, not intentness should be now the rule. Give up the feeling of responsibility, let go your hold[...] The regenerative phenomena which ensue on the abandonment of effort remain firm facts of human nature" (cited in Fadiman 1976, p.229). Here James's "abandonment of effort" seems strikingly similar to the Buddhist notion of the detachment from desire.

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